



## Primary Multidrug-Resistant Tuberculosis in St. Louis City, 1997–99

Lynelle Phillips, R.N., M.P.H.  
Section of Vaccine-Preventable and  
Tuberculosis Disease Elimination

This report summarizes four cases of primary multidrug-resistant tuberculosis (MDR-TB) diagnosed in St. Louis City between February 1997 and August 1999. Primary MDR-TB occurs in patients who have not previously been treated for tuberculosis.<sup>1</sup> Three of the four cases described here were culture positive and resistant to INH, RIF and Streptomycin. These cases exemplify the need for heightened awareness of the signs and symptoms of TB in the St. Louis area, especially in emergency care departments. It is likely that there are other cases of MDR-TB yet to be diagnosed, and that these cases will probably initially seek care at emergency departments. Early identification and treatment of MDR-TB is the best way to prevent further transmission.

### Case 1

A 40-year-old man presented to a St. Louis area emergency department and was subsequently hospitalized with flu-like symptoms in February 1997. His chest x-ray revealed prominent hilar adenopathy, diffuse infiltrates in the upper lobes and multiple areas of cavitation. The sputum was found to be positive for acid-fast bacilli with many organisms seen. The patient was immediately started on twice weekly INH,

RIF, Pyrazinamide (PZA) and Ethambutol (EMB). At the time of admission, he was noted to be malnourished, co-infected with hepatitis C and negative for HIV. Significant risk factors for active TB included a history of homelessness, alcohol dependence, and non-injecting and injecting drug use. He was unemployed, a smoker and resided both with relatives and in a shelter. He was discharged to the home of a relative and received directly observed therapy (DOT) until he was readmitted for an unrelated complaint on March 8, 1997. His initial culture taken on March 18, 1997, grew *Mycobacterium tuberculosis*. He was subsequently committed by a Health Commissioner's order to the Missouri Rehabilitation Center (MRC) in Mt. Vernon, MO to complete therapy because the relative who had previously taken him in was unwilling to do so again, and it is very difficult to do appropriate follow-up on someone who is homeless. Shortly after arrival at MRC, drug sensitivities revealed resistance to INH, RIF and Streptomycin. His therapy was changed to daily EMB, Ciprofloxacin, Ethionamide, Clofazimine, Capreomycin and PZA. The patient experienced intolerance of some of the medications and therapy was completed with EMB, Ethionamide, Ciprofloxacin and PZA. Serial sputum cultures converted to negative on June 11, 1997, and remained negative through December 3, 1997. He was declared cured and released on December 12, 1997.

After it was discovered that the patient was a contact to Case 2 (see page 2), he was asked to return to the St. Louis City Tuberculosis Clinic on June 15, 1998, for a repeat chest x-ray which showed improvement with resolution of the right upper lobe infiltrate and some residual left upper lobe findings. A sputum culture taken on July 28, 1998, was negative.

In February 1999, the patient again returned to the St. Louis City Tuberculosis Clinic with complaints of cough and night sweats. Another chest x-ray was performed and revealed complete resolution of the previous infiltrates with some left upper lobe scarring. A sputum culture taken on February 19, 1999 was negative. Recent attempts to

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locate and reevaluate the patient have been unsuccessful.

Six household contacts to this case were investigated. Four contacts were skin-test negative at both the initial and three-month evaluations. Two other contacts, both adults, were skin test positive ( $>15$  mm induration) and were initially placed on INH. Their medication was subsequently changed to EMB and PZA. An additional contact, a 9-year-old male, was later identified through a positive routine screening and epidemiologically linked to the first case. The child was treated with 12 months of EMB and PZA.

### Case 2

In the last week of May 1998, a 2-year-old boy was seen by his primary care physician for a routine examination. The child was given a PPD test because the mother's 10-year-old brother had a positive PPD the year before (see Case 1). The skin test result was 15 mm and the boy was referred to a children's hospital for further evaluation. He was residing with his 17-year-old mother and 10-year-old uncle at the home of his paternal grandfather. The location was reported to be a drug house and Case 1 was subsequently identified as an associate of the paternal grandfather. The mother reported no known contact of her son with Case 1, but both the child and Case 1 were frequent occupants of the house. Upon admission to the hospital, the child was found to have a chest x-ray significant for right lung infiltrate and atelectasis. He was mildly anemic with both height and weight below the fifth percentile. An HIV test was negative. He was discharged from the hospital, and he and his mother went to a family shelter where he was to receive DOT.

The child was readmitted to the hospital seven days later in the custody of the Division of Family Services because his mother failed to comply with DOT at the shelter and had returned with the child to the home of her father. During the second admission, the child under-

went bronchoscopy and biopsy. All samples, including the original gastric aspirates and urine, were acid-fast bacilli and culture negative. While in the hospital, the boy's connection to Case 1, who was on a daily regimen of INH, RIF, EMB and PZA, was discovered. The boy was then placed on a five-drug regimen consisting of INH, Rifabutin, EMB, PZA and intravenous Amikacin for two months. Therapy with INH, Rifabutin, EMB and PZA was continued for a total of 12 months. At last evaluation in September 1999, he was free of tuberculosis.

### Case 3

A 43-year-old man was admitted to a St. Louis hospital on June 26, 1999, complaining of intermittent nausea, vomiting and diarrhea. He was in his usual state of health until three weeks prior to admission when he developed a productive cough of green sputum, shortness of breath on exertion, shaking chills and night sweats. He also reported a 30 pound weight loss over the same time period with post-tussive emesis that contained blood. The chest x-ray revealed a nodular right upper lobe infiltrate with one large and several smaller cavities. Infiltrates were also noted in the right middle lobe and left lung likely representing active tuberculosis with bronchogenic spread. Significant findings on admission included low-grade fever, cachexia, anemia and hypoalbuminemia. An HIV test was negative. He reported that he had had a negative TB skin test on employment some time in the preceding year. TB was suspected in the emergency department and he was placed in isolation. A sputum smear from June 27, 1999 was 4+ for acid-fast bacilli and he was placed on four-drug therapy with INH, RIF, PZA and EMB. Risk factors for TB included a history of homelessness over the previous three years; however, the patient denied staying in shelters. He admitted to a 15-pack-year smoking habit and past crack cocaine use, but denied ever being incarcerated. The patient also had alcohol dependence and a history of psychiatric problems. He reported no homosexual

activity and was not employed in the medical care field. He resided with a friend at the time of diagnosis, but because of his 4+ smear results and extensive contact with relatives and multiple children at that residence, it was decided that he should not return to that residence. He could not remain in the hospital, so he was transferred by Health Commissioner order to MRC on July 2, 1999. While at MRC, drug sensitivities showed resistance to INH, RIF and Streptomycin. He was placed on a regimen of PZA, EMB, Levofloxacin and Ethionamide and is expected to remain at MRC until completion of 12 months of therapy.

Contact investigation for this case identified 25 contacts to date. Two adults were placed on prophylaxis with PZA and EMB. One had a  $>20$  mm PPD and the other was skin-test negative but had a history of alcoholism which is a medical risk factor for a false negative skin test and developing active TB. Fifteen children under the age of 15 years were all initially skin test negative and were placed under a protocol of monthly skin tests and observation. Seven have been PPD tested twice with continued negative results. The remaining children have not undergone further skin testing and efforts to locate them and adult contacts for repeat PPD testing are ongoing. No secondary cases have been identified.

### Case 4

A 58-year-old man who was undergoing alcohol detoxification treatment was transferred to a St. Louis hospital on August 10, 1999, for evaluation of a mental status change and right-sided weakness. The patient had a history of hypertension, evidence of an old lacunar cerebral infarct, newly diagnosed hyperglycemia and previous surgery for a chest stab wound. He was confused upon admission and denied all signs and symptoms of tuberculosis. The admission chest x-ray showed two spiculated masses in the right upper lobe with confluent infiltrates. A bulla in the left upper lobe was also detected. A PPD placed upon admission was

17 mm. He denied ever being homeless, staying in a shelter, substance abuse other than alcohol or imprisonment, but reported exposure to a relative from Illinois with a history of tuberculosis. He was unemployed, had a 30-pack-year smoking history and consumed three pints of alcohol nightly. Laboratory results showed borderline anemia, hypoalbuminemia and a negative HIV result. A smear obtained at the time of bronchoscopy was negative. Because of his risk factors and suspicious radiographic findings, the patient underwent bronchoscopy and trans-bronchial biopsy. He was empirically started on INH, RIF, PZA and EMB. After hospital discharge on August 17, 1999, the patient was not locatable for DOT until August 23, 1999. He cultured positive for *M. tuberculosis* on September 10, 1999, and his sensitivities revealed drug resistance to INH, RIF and Streptomycin on September 22, 1999. He was admitted to MRC on September 22, 1999, and remains there for treatment.

Contact investigation for this case is still in progress and to date no positive contacts have been found. Family members have been refusing follow-up skin tests and other evaluations, which has complicated this investigation. A search of the Illinois TB disease register did not discover the relative from Illinois named as the source of the patient's TB.

## Discussion

The three adult cases discussed in these case scenarios share the same drug resistance pattern, and are the same strain of TB; however, they have not been linked epidemiologically. None of the cases named each other as contacts. Two were hospitalized on the same ward at MRC and did not recognize each other. At the writing of this article, a common source case or cases, or a common site of transmission had not been identified.

The three adult cases do have several demographic characteristics in common. These include alcohol dependence,

unemployment (at time of diagnosis or within the last three years), drug use, and homelessness. All three were 40–59 years of age and African-American. Two lived in north St. Louis City and Case 3 lived in south St. Louis City. All were HIV negative. All had no history of previous TB disease, and were considered to be primary MDR-TB cases. They have all been confirmed (through RFLP typing) to have the same strain of TB.<sup>2</sup>

There are at least two reasons to believe that this outbreak of MDR-TB will continue. First, there may be one or more unidentified source case(s) linking the three adult cases that have yet to seek treatment. Cases 1 and 3 were quite advanced, as evidenced by their chest x-rays revealing multiple cavities. It appears that they both had extended periods of illness and had delayed treatment. This is not uncommon. Research of TB cases in Los Angeles County found that lack of employment and of knowledge about where to obtain care were more closely associated with a delay of treatment (>60 days) than was severity of illness. It is likely then that if other MDR-TB cases exist in the St. Louis area with similar demographics, they will also delay treatment, optimizing further spread of disease.<sup>3</sup>

Second, known and unknown social contacts to these three adult cases have the potential to develop MDR-TB. PPD-positive contacts to MDR-TB cases have reduced treatment options. Some of the contacts in these scenarios were treated with PZA and EMB for six months or longer; however, the effectiveness of this treatment is virtually unknown. For this reason, other close contacts are being followed with monthly symptom reviews and PPDs for three months. Tracking known contacts that are transient and have histories of drug use, alcohol abuse and unemployment can be exceedingly difficult and labor intensive and cannot continue indefinitely. At the writing of this article, a contact to Case 3 has exhibited signs and symptoms of TB and is being treated presumptively for MDR-TB. This case

may become the fifth case of MDR-TB in the St. Louis area.

The pediatric case discussed as Case 2 illustrates that even well-designed contact investigations may not identify all contacts if source cases are not entirely cooperative and forthcoming with their contacts. However, we do not expect Case 2, because of his age, to contribute to the spread of MDR-TB. Children, particularly those 5-years-old and under, are more likely to develop TB once infected, but they are not likely to be significant sources of transmission. Their respiratory systems are not sufficiently mature to generate the airborne droplet nuclei required for TB transmission.<sup>4</sup> We are concerned that contacts to the three adult cases will develop active disease after the health department has ceased tracking them.

Because of the health hazards associated with exposure to an MDR-TB case, heightened awareness about the signs and symptoms of TB, risk factors for TB (including unemployment and alcohol use) and the need for prompt isolation of potential TB cases is more critical than ever for St. Louis area emergency departments and hospitals. An algorithm developed by Harbor-UCLA Hospital<sup>5</sup> and suggested for use by emergency departments is reprinted on page 5. The St. Louis City Health Department, the Missouri Department of Health, the American Lung Association of Eastern Missouri, and other St. Louis area health care providers are working closely together on a comprehensive plan to halt further transmission of MDR-TB in the St. Louis area and statewide. See related article on page 4.

## **Suspected cases of TB should be reported to your local public health agency within 24 hours.**

If you have questions about TB, contact your local public health agency or the Missouri Department of Health, Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 611-2912.

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# Follow-Up of Multidrug-Resistant Tuberculosis in St. Louis

Larry E. Fields, M.D., M.B.A., Director  
St. Louis City Department of Health

The fact that there have been four cases of multi-drug resistant tuberculosis (MDR-TB) is important for the St. Louis area. A contact to one of the four cases is being followed and may or may not become the fifth case of MDR-TB in the St. Louis area. Although the absolute number is small, there have been 156 cases of tuberculosis (TB) disease over the same period of time. It points to the need to be as aggressive as possible in preventing, identifying and successfully treating such cases. Given a rising number of immigrants from areas of the world where MDR-TB is endemic and diminishing funds for critical TB control activity, it is important to call attention to this threat as soon as possible. There is no better time than now.

The risk factors for the development of TB and MDR-TB must be reviewed periodically.<sup>1</sup> They should serve as the basis for a high clinical index of suspicion when caring for patients who might be affected. General risk factors include living in crowded institutional settings (e.g., prisons), poverty, immigration from TB-endemic areas, HIV positive status, homelessness, and poor adherence to TB treatment protocols. A suboptimal or deteriorating infrastructure of public health TB-surveillance, epidemiology and control contributes to the risk of transmitting TB. The rise in TB cases nationally from 1985 to 1992 was largely due to an increase in MDR-TB infected persons who were also HIV infected in institutional settings.<sup>2</sup>

To assist in addressing the MDR-TB problem, the St. Louis City Health Department is developing a five-year strategic plan for TB elimination. In addition, the department is reviewing programs to assure that all TB cases are

diagnosed. This includes enhanced education and awareness programs for providers and managed care plans, as well as for the public. The department will also work to assure that individuals with TB are effectively treated using directly observed therapy (DOT).

Prompt and effective contact investigation activities, as well as identification and treatment of persons with latent TB or who are otherwise at high risk for TB, have been enhanced by hiring additional staff (nurses). Complete and timely reporting of all TB cases is essential. Surveillance of incarcerated, homeless and mentally ill populations is being performed. Enhanced and regular training of staff has been implemented. Indicators and evaluation measures are being developed to monitor programmatic and operational performance.

Broader collaborations with community-based organizations that provide services to persons who are at risk for TB are being developed. Continued participation in collaborative public health research is also important.

A false sense of complacency about the total number of TB cases must also be avoided. In 1999, there were 41 cases of TB, a 25 percent reduction compared to 1998, and a 32 percent reduction compared to 1997. TB elimination will require continued and aggressive activities and resources. We face a 19 percent reduction in TB prevention and control funding for the next fiscal year. Accordingly, more creative funding strategies must be pursued while working cooperatively with the Missouri Department of Health to persuade the Centers for Disease Control and Prevention (CDC) and national policy makers to increase funding. We must also work to assure that existing funds are efficiently utilized.

MDR-TB is emerging again. Let's take steps to stop it now.

## REFERENCES:

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2. CDC. Nosocomial transmission of multidrug-resistant tuberculosis among HIV-infected persons—Florida and New York, 1988-1991. MMWR 1991;40(34):585-91.

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## Multidrug-Resistant Tuberculosis

(continued from page 3)

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1. Raviglione MC, Snider DE, Kochi A. Global epidemiology of tuberculosis, morbidity and mortality of a worldwide epidemic. JAMA 1995;27:220-26.
2. Missouri Department of Health (Jan. 6, 2000). Report of DNA fingerprint results.
3. Asch S, Leake B, Anderson R, Gelberg L. Why do symptomatic patients delay obtaining care for tuberculosis? Am J Respir Crit Care Med 1998; 157:1244-48.
4. Stark, J. Pediatric Tuberculosis Course Syllabus. Tuberculosis 2000: Fundamentals of Clinical Tuberculosis and Tuberculosis Control Satellite Conference. January 23, 30 and February 6, 1997.
5. Francis J. Curry National Tuberculosis Center, Institutional Consultation Services. A guideline for establishing effective practices: Identifying persons with infectious TB in the emergency department. 1998:[14].  
<http://www.nationaltbcenter.edu/ics/ICS.pdf>

# HARBOR-UCLA TRIAGE CRITERIA FOR RESPIRATORY ISOLATION TUBERCULOSIS PRECAUTIONS (RIPT)

Chief Complaint: \_\_\_\_\_ Date: \_\_\_\_\_

## CHECK ALL APPLICABLE RISK FACTORS, SYMPTOMS, OR COMPLAINTS:

### Risk Factors

- ☐ (2) HIV Positive
- ☐ (1) Male Homosexual
- ☐ (1) Foreign-Born
- ☐ (2) Homeless or In Shelter
- ☐ (1) IVDA
- ☐ (4) History of Active TB Now or at Any Time In the Past (even if on meds)
- ☐ (2) In Jail Within Last 2 Years
- ☐ (2) Newly PPD Positive (within 2 years) or History of Recent TB Exposure

### Symptoms/Complaints

- ☐ (3) Cough (any duration)
- ☐ (2) Fever or Chills or Night Sweats
- ☐ (2) Weight Loss >10 Pounds
- ☐ (5) Hemoptysis

**Total Points:** \_\_\_\_\_

## RIPT FOR 5 OR MORE POINTS

Add up points. Respiratory Isolation scale scores of 5 or more points indicate a need for immediate mask and respiratory isolation packet (RIPT Packet). For patients meeting criteria, please order a PA and lateral chest X-ray and have an emergency medicine senior resident or emergency medicine attending physician record their reading of the chest X-ray and their decision regarding the need for continued isolation below. This form should be attached to the nursing notes for the patient and, when the chart is broken down, returned to the envelope by the clerk's desk. All patients with scores of 5 or more must be entered in the RIPT logbook.

Complete below only for patient meeting RIPT criteria:

Name: \_\_\_\_\_  
Last First MI

Assigned RIPT Number: \_\_\_\_\_

### Chest X-ray result (to be recorded by physician reading film, check all that apply):

- ☐ Upper Lobe Infiltrate(s)
- ☐ Diffuse Infiltrate or Interstitial Pattern
- ☐ Mediastinal Lymphadenopathy
- ☐ Other Findings (hyperinflation, rib fractures, etc.)
- ☐ Normal
- ☐ Infiltrate Not in Upper Lobe(s)
- ☐ Pleural Effusion
- ☐ Mass or Coin Lesion (not cavitary)
- ☐ Cavitary Lesion

# Human Granulocytic Ehrlichiosis

Office of Epidemiology

Last summer researchers from Washington University published in the New England Journal of Medicine an article summarizing four patients in Missouri suffering from infections with *Ehrlichia ewingii*. This agent was first known to infect dogs. The illnesses in the Missouri patients were febrile, with headache and thrombocytopenia. Two of the four had leukopenia. One had myalgia and a stiff neck and one had abnormal liver function tests. They ranged in age from 11 to 65, were all male, all gave a history of exposure to ticks and all responded well to doxycycline. Three were on immunosuppressive therapy, each for a different reason. The illnesses occurred in the months of May through August of 1996, 1997 and 1998. These cases were laboratory confirmed using polymerase-chain-reaction (PCR) and by nucleotide sequencing. The sequences were all identical, different from the sequence of *Ehrlichia chaffeensis* and matched the sequence of *E. ewingii*. Morulae were found in the granulocytes of two patients. In three of the patients whose convalescent sera were tested by indirect immunofluorescence assay high titers were found for *E. chaffeensis*, but western blot analysis demonstrated that these were cross reactions with *E. ewingii*.

newsletter.

the May-June 2000 issue of this newsletter.

agent similar to *E. equi* and *E. phagocytophila*, often referred to as the "agent of HGE." PCR tests on these four patients were negative for the "agent of HGE." The vector of *E. chaffeensis* in Missouri is the Lone Star Tick (*Amblyomma*

Figure 2. Reported ehrlichiosis cases by county, Missouri, 1997-98.

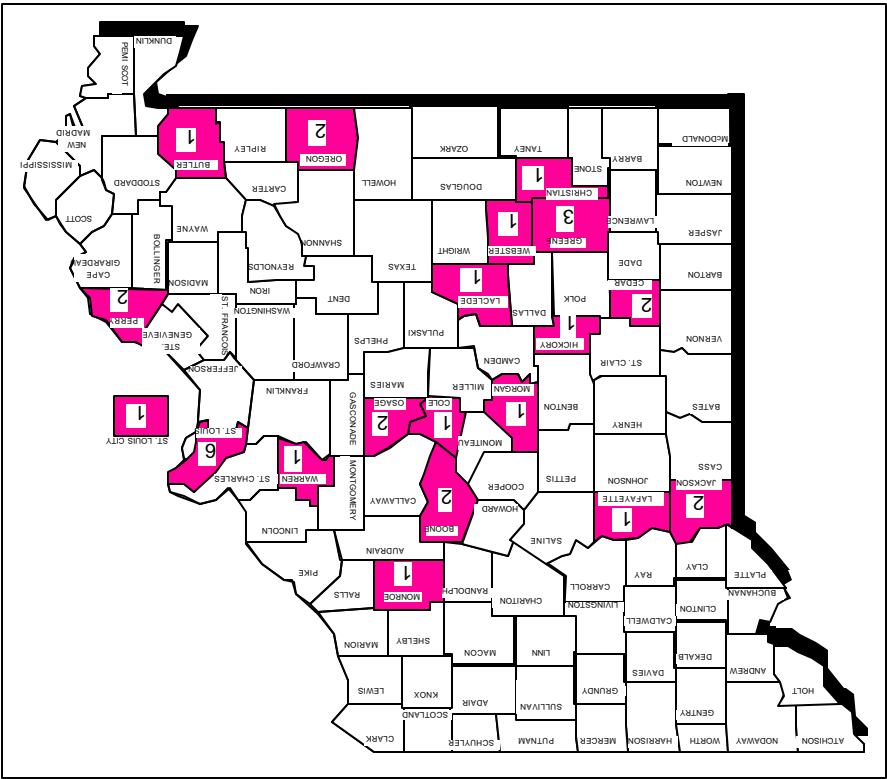


Figure 1. Reported ehrlichiosis cases by year of report, Missouri, 1988-99.



*americanum*). This same tick is known to vector the *E. ewingii* in dogs. The vector for the agent of HGE in other parts of the United States is *Ixodes scapularis*.

Illnesses with ehrlichiosis infection range from very mild to life threatening and fatal. The incubation period ranges from 7 to 21 days. Patients may complain of fever, headache, myalgia, loss of appetite, nausea and vomiting. Leukopenia, thrombocytopenia and elevation of liver enzymes may be found. Inclusion bodies known as morulae may be seen in white blood cells on blood or buffy coat smears. A four-fold titer rise or fall with acute and convalescent sera is diagnostic. At the present time, it is thought that the human illnesses caused by the various *Ehrlichia* agents are clinically indistinguishable, and all forms respond to doxycycline therapy.

Prevention involves avoidance of ticks by avoidance of their habitat or by use

of tick repellent and protective clothing when exposure is unavoidable. Dogs may participate in the transmission cycle, and should be avoided to the extent possible. Close examination of the skin to permit removal of ticks is advisable after exposure to potential tick-infested areas or to tick-infested dogs.

Clinicians should keep these syndromes in their differential diagnosis of febrile illness in the warmer months of the year, especially in immunosuppressed patients. The public should be reminded that other illnesses are also carried by ticks, including the more common, but serious and potentially fatal Rocky Mountain spotted fever and tularemia as well as borreliosis (Lyme or Lyme-like disease) and babesiosis.

For laboratory testing, serum specimens (acute and convalescent drawn four weeks apart) should be submitted to the State Public Health Laboratory. They

will forward the specimens on to the Centers for Disease Control and Prevention (CDC) for testing. Please contact the State Public Health Laboratory at (573) 751-0633 to obtain submission form and instructions.

Ehrlichiosis is reportable in Missouri, and should be reported to your local public health agency within three days of first knowledge or suspicion. If you have questions about ehrlichiosis, please contact the Section of Communicable Disease Control and Veterinary Public Health at (800) 392-0272.

#### REFERENCES:

1. Buller RS, Arens M, Hmiel SP, et al. *Ehrlichia ewingii*, a newly recognized agent of human ehrlichiosis. *N Engl J Med* 1999;341(3):148-55.
2. Chin J. Control of communicable diseases manual. Washington, DC: American Public Health Association, 2000.

## Food That's In When School Is Out! Summer Food Service Program

Researchers at the National Center on Hunger and Poverty at Tufts University in Boston report that recent years of exceptional economic growth have failed to produce a commensurate reduction in food insecurity and hunger. "For the first time in modern history," reports center director Dr. J. Larry Brown, "the prevalence of hunger seems stubbornly impervious to economic growth. At the peak of the longest economic boom in our history, over 30 million people live in households that experience hunger and food insecurity—about the same number as four years ago."

During the school year, the National School Lunch Program offers meals at free or reduced prices. Many children from households that experience hunger and food insecurity participate in this national program, but, during the summer months, there are many who do not receive an adequate diet. The Summer Food Service Program is available to organizations to support efforts in combating food insecurity in the community. Combining the Summer Food Service Program with summer enrichment programs could truly help those who need it most. A student who consumes nutritionally adequate meals will be better prepared to learn.

With summer approaching quickly, we invite you to learn more about the exciting opportunities that abound in the Summer Food Service Program. For more information, please call the Department of Health, Bureau of Nutrition and Child Care Programs at (888) 435-1464.

# Recommended Childhood Immunization Schedule— United States, 2000

*Reprinted from the Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (MMWR), January 21, 2000, Vol. 49, No. 2.*

Each year, CDC's Advisory Committee on Immunization Practices (ACIP) reviews the recommended childhood immunization schedule to ensure it remains current with changes in manufacturers' vaccine formulations, revisions in recommendations for the use of licensed vaccines, and recommendations for newly licensed vaccines. This report presents the recommended childhood immunization schedule for 2000 and explains the changes that have occurred since January 1999. See immunization schedule on pages 9–10.

Since the publication of the immunization schedule in January 1999<sup>1</sup>, ACIP, the American Academy of Family Physicians, and the American Academy of Pediatrics have recommended removal of rotavirus vaccine from the schedule, endorsed an all-inactivated poliovirus vaccine (IPV) schedule for polio vaccination, recommended exclusive use of acellular pertussis vaccines for all doses of the pertussis vaccine series, and added hepatitis A vaccine (Hep A) to the schedule to reflect its recommended use in selected geographic areas.<sup>2</sup> Detailed recommendations for using vaccines are available from the manufacturers' package inserts, ACIP statements on specific vaccines, and the 1997 Red Book.<sup>3</sup> ACIP statements for each recommended childhood vaccine can be viewed, downloaded, and printed at CDC's National Immunization Program World-Wide Web site, <http://www.cdc.gov/nip/publications/acip-list.htm>.

## Removal of Rotavirus Vaccine From the Schedule

On October 22, 1999, ACIP recommended that Rotashield®\* (rhesus rotavirus vaccine-tetravalent [RRV-

TV]) (Wyeth Laboratories, Inc., Marietta, Pennsylvania), the only U.S. licensed rotavirus vaccine, no longer be used in the United States.<sup>4</sup> The decision was based on the results of an expedited review of scientific data presented to ACIP by CDC. Data from the review indicated a strong association between RRV-TV and intussusception among infants 1–2 weeks following vaccination. Vaccine use was suspended in July pending the ACIP data review. Parents should be reassured that children who received the rotavirus vaccine before July are not at increased risk for intussusception now. The manufacturer withdrew the vaccine from the market in October.

## Inactivated Poliovirus Vaccine for All Four Doses

As the global eradication of poliomyelitis continues, the risk for importation of wild-type poliovirus into the United States decreases dramatically. To eliminate the risk for vaccine-associated paralytic poliomyelitis (VAPP), an all-IPV schedule is recommended for routine childhood vaccination in the United States.<sup>5</sup> All children should receive four doses of IPV: at age 2 months, age 4 months, between ages 6 and 18 months, and between ages 4 and 6 years. Oral poliovirus vaccine (OPV), if available, may be used only for the following special circumstances:

1. Mass vaccination campaigns to control outbreaks of paralytic polio.
2. Unvaccinated children who will be traveling within 4 weeks to areas where polio is endemic or epidemic.
3. Children of parents who do not accept the recommended number of vaccine injections; these children may receive OPV only for the third or fourth dose or both. In this situation, health-care providers should administer OPV

only after discussing the risk for VAPP with parents or caregivers.

OPV supplies are expected to be very limited in the United States after inventories are depleted. ACIP reaffirms its support for the global eradication initiative and use of OPV as the vaccine of choice to eradicate polio where it is endemic.

## Acellular Pertussis Vaccine

ACIP recommends exclusive use of acellular pertussis vaccines for all doses of the pertussis vaccine series. The fourth dose may be administered as early as age 12 months, provided 6 months have elapsed since the third dose and the child is unlikely to return at 15–18 months.

## Hepatitis A

Hepatitis A vaccine (Hep A) is listed on the schedule for the first time because it is recommended for routine use in some states and regions. Its appearance on the schedule alerts providers to consult with their local public health authority to learn the current recommendations for hepatitis A vaccination in their community. Additional information on the use of Hep A can be found in recently published guidelines.<sup>2</sup>

**Editor's Note:** The ACIP recommends that children receive routine vaccination against hepatitis A in states with high rates of hepatitis A incidence. Missouri children should routinely receive hepatitis A vaccination at the appropriate age.

## Hepatitis B

Special considerations apply in the selection of hepatitis B vaccine products for the dose administered at birth.<sup>6</sup>

*(continued on page 13)*

\* Use of trade names and commercial sources is for identification only and does not constitute or imply endorsement by CDC or the U.S. Department of Health and Human Services.

# Recommended Childhood Immunization Schedule

## United States, January - December 2000

Vaccines<sup>1</sup> are listed under routinely recommended ages. **Bars** indicate range of recommended ages for immunization. Any dose not given at the recommended age should be given as a "catch-up" immunization at any subsequent visit when indicated and feasible. **Ovals** indicate vaccines to be given if previously recommended doses were missed or given earlier than the recommended minimum age.

Age ► Vaccine ▼	Birth	1 mo	2 mos	4 mos	6 mos	12 mos	15 mos	18 mos	24 mos	4-6 yrs	11-12 yrs	14-16 yrs
Hepatitis B <sup>2</sup>	Hep B											
		Hep B			Hep B						Hep B	
Diphtheria, Tetanus, Pertussis <sup>3</sup>			DTaP	DTaP	DTaP		DTaP <sup>3</sup>			DTaP	Td	
<i>H. influenzae</i> type b <sup>4</sup>			Hib	Hib	Hib	Hib						
Polio <sup>5</sup>			IPV	IPV	IPV <sup>5</sup>					IPV <sup>5</sup>		
Measles, Mumps, Rubella <sup>6</sup>						MMR				MMR <sup>6</sup>	MMR <sup>6</sup>	
Varicella <sup>7</sup>						Var					Var <sup>7</sup>	
Hepatitis A <sup>8</sup>									Hep A <sup>8</sup> -in selected areas			

Approved by the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).

On October 22, 1999, the Advisory Committee on Immunization Practices (ACIP) recommended that Rotashield® (RRV-TV), the only U.S.-licensed rotavirus vaccine, no longer be used in the United States (MMWR, Volume 48, Number 43, Nov. 5, 1999). Parents should be reassured that their children who received rotavirus vaccine before July are not at increased risk for intussusception now.

- <sup>1</sup> This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines as of 11/1/99. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and its other components are not contraindicated. Providers should consult the manufacturers' package inserts for detailed recommendations.
- <sup>2</sup> **Infants born to HBsAg-negative mothers** should receive the 1st dose of hepatitis B (Hep B) vaccine by age 2 months. The 2nd dose should be at least one month after the 1st dose. The 3rd dose should be administered at least 4 months after the 1st dose and at least 2 months after the 2nd dose, but not before 6 months of age for infants. **Infants born to HBsAg-positive mothers** should receive hepatitis B vaccine and 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth at separate sites. The 2nd dose is recommended at 1 month of age and the 3rd dose at 6 months of age. **Infants born to mothers whose HBsAg status is unknown** should receive hepatitis B vaccine within 12 hours of birth. Maternal blood should be drawn at the time of delivery to determine the mother's HBsAg status; if the HBsAg test is positive, the infant should receive HBIG as soon as possible (no later than 1 week of age). **All children and adolescents (through 18 years of age)** who have not been immunized against hepatitis B may begin the series during any visit. Special efforts should be made to immunize children who were born in or whose parents were born in areas of the world with moderate or high endemicity of hepatitis B virus infection.
- <sup>3</sup> The 4th dose of DTaP (diphtheria and tetanus toxoids and acellular pertussis vaccine) may be administered as early as 12 months of age, provided 6 months have elapsed since the 3rd dose and the child is unlikely to return at age 15-18 months. Td (tetanus and diphtheria toxoids) is recommended at 11-12 years of age if at least 5 years have elapsed since the last dose of DTP, DTaP or DT. Subsequent routine Td boosters are recommended every 10 years.
- <sup>4</sup> Three *Haemophilus influenzae* type b (Hib) conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB® or ComVax® [Merck]) is administered at 2 and 4 months of age, a dose at 6 months is not required. Because clinical studies in infants have demonstrated that using some combination products may induce a lower immune response to the Hib vaccine component, DTaP/Hib combination products should not be used for primary immunization in infants at 2, 4 or 6 months of age, unless FDA-approved for these ages.
- <sup>5</sup> To eliminate the risk of vaccine-associated paralytic polio (VAPP), an all-IPV schedule is now recommended for routine childhood polio vaccination in the United States. All children should receive four doses of IPV at 2 months, 4 months, 6-18 months, and 4-6 years. OPV (if available) may be used only for the following special circumstances:
  1. Mass vaccination campaigns to control outbreaks of paralytic polio.
  2. Unvaccinated children who will be traveling in <4 weeks to areas where polio is endemic or epidemic.
  3. Children of parents who do not accept the recommended number of vaccine injections. These children may receive OPV only for the third or fourth dose or both; in this situation, health-care providers should administer OPV only after discussing the risk for VAPP with parents or caregivers.
  4. During the transition to an all-IPV schedule, recommendations for the use of remaining OPV supplies in physicians' offices and clinics have been issued by the American Academy of Pediatrics (see *Pediatrics*, December 1999).
- <sup>6</sup> The 2nd dose of measles, mumps, and rubella (MMR) vaccine is recommended routinely at 4-6 years of age but may be administered during any visit, provided at least 4 weeks have elapsed since receipt of the 1st dose and that both doses are administered beginning at or after 12 months of age. Those who have not previously received the second dose should complete the schedule by the 11-12 year old visit.
- <sup>7</sup> Varicella (Var) vaccine is recommended at any visit on or after the first birthday for susceptible children, i.e. those who lack a reliable history of chickenpox (as judged by a health care provider) and who have not been immunized. Susceptible persons 13 years of age or older should receive 2 doses, given at least 4 weeks apart.
- <sup>8</sup> Hepatitis A (Hep A) is shaded to indicate its recommended use in selected states and/or regions. The ACIP recommends that children receive routine vaccination against hepatitis A in states with high rates of hepatitis A incidence. Missouri children should routinely receive hepatitis A vaccination at the appropriate age. (Also see MMWR Oct. 01, 1999/48(RR12);1-37.)

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### **KEY**

J/F99 = January/February 1999  
M/A99 = March/April 1999  
M/J99 = May/June 1999  
J/A99 = July/August 1999  
S/O99 = September/October 1999  
N/D99 = November/December 1999

# Department of Health Study Finds African Americans at Greater Risk for Cardiovascular Disease

Diana Hawkins  
Cardiovascular Health Program

A recent study by the Missouri Department of Health has found that African Americans in three regions of Missouri have risk factors that increase their vulnerability to cardiovascular disease (heart disease and stroke), which is the leading cause of death and disability in the state.

The study looked at risk factors for cardiovascular disease (CVD) including smoking, physical inactivity, obesity, hypertension and unmonitored cholesterol, in the three areas of the state with the highest populations of African Americans—St. Louis City, Kansas City and the Bootheel area.

According to the findings, African Americans in these areas were more likely than the state average to have risk factors for CVD.

For example, the study revealed that in 1996 the rate of obesity among African American females was more than twice the rate among other women statewide.

The report documents that during the years studied, 1990 through 1996, there was no improvement in any of the risk factors for African American males although there was a decrease in physical inactivity among African American females. Positive findings among other groups include an increase in physical activity among white females and a decrease in hypertension (high blood pressure) among white women age 18–34.

This study indicates a need for concern because cardiovascular disease is the major killer in this state, and many African Americans appear to be at increased risk for CVD. This study will enable the department to better direct its resources to help Missourians

decrease their risk of dying from heart disease.

Missouri has a grant from the Centers for Disease Control and Prevention (CDC) to develop a comprehensive state plan to reduce the risk factors for CVD in Missouri. The plan, which will be implemented this winter, will have an emphasis on addressing risk factors impacting African Americans.

Following are additional facts about cardiovascular disease in Missouri:

- Heart disease and stroke killed 174,640 Missourians between 1990 and 1997.
- Hospitalization expenditures relating to CVD cost Missouri more than one billion dollars in 1997 alone.

- During the study period, the three-region study population had a higher overall prevalence of smoking, obesity, hypertension and unmonitored cholesterol than the overall prevalence for the state of Missouri.
- Between 1990 and 1996, the overall prevalence of obesity increased in the study population, especially among African-American females.

A copy of the study, *Changes in Prevalence of Modifiable Cardiovascular Disease Risk Factors in Three Regions of Missouri, 1990–1996*, is available by contacting Diana Hawkins, Manager, Cardiovascular Health Program, at (573) 876-3207.

## 2000 Immunization Schedule

(continued from page 8)

### Vaccine Information Statements

The National Childhood Vaccine Injury Act requires that all health-care providers, whether public or private, give to parents or patients copies of Vaccine Information Statements before administering each dose of the vaccines listed in this schedule (except Hep A). Vaccine Information Statements, developed by CDC, can be obtained from state health departments and CDC's World-Wide Web site, <http://www.cdc.gov/nip/publications/VIS>. Instructions on use of the Vaccine Information Statements are available from CDC's website or the December 17, 1999, Federal Register (64 FR 70914).

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# Achievements in Public Health, 1900–1999: Changes in the Public Health System

*Reprinted from the Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (MMWR), December 24, 1999, Vol. 48, No. 50. As indicated in the article, this is just one of a series of articles published in the MMWR relating to achievements in public health, 1900–1999. The MMWR is available electronically and those issues can be found at <http://www2.cdc.gov/mmwr/index99.htm>.*

The 10 public health achievements highlighted in this MMWR series (see box) reflect the successful response of public health to the major causes of morbidity and mortality of the 20th century.<sup>1–11</sup> In addition, these achievements demonstrate the ability of public health to meet an increasingly diverse array of public health challenges. This report highlights critical changes in the U.S. public health system this century.

In the early 1900s in the United States, many major health threats were infectious diseases associated with poor hygiene and poor sanitation (e.g., typhoid), diseases associated with poor nutrition (e.g., pellagra and goiter), poor maternal and infant health, and diseases or injuries associated with unsafe workplaces or hazardous occupations.<sup>4,5,7,8</sup> The success of the early public health system to incorporate biomedical advances (e.g., vaccinations and antibiotics) and to develop interventions such as health education programs resulted in decreases in the impact in these diseases. However, as the incidence of these diseases decreased, chronic diseases (e.g., cardiovascular disease and cancer) increased.<sup>6,10</sup> In the last half of the century, public health identified the risk factors for many chronic diseases and intervened to reduce mortality. Public efforts also led to reduced deaths attributed to a new technology, the motor vehicle.<sup>3</sup> These successes demonstrated the value of community action to address public health issues and have

## Ten Great Public Health Achievements United States, 1900–1999

- Vaccination
- Motor-Vehicle Safety
- Safer Workplaces
- Control of Infectious Diseases
- Decline in Deaths From Coronary Heart Disease and Stroke
- Safer and Healthier Foods
- Healthier Mothers and Babies
- Family Planning
- Fluoridation of Drinking Water
- Recognition of Tobacco Use as a Health Hazard

fostered public support for the growth of institutions that are components of the public health infrastructure\*. The focus of public health research and programs shifted to respond to the effects of chronic diseases on the public's health.<sup>12–17</sup> While continuing to develop and refine interventions, enhanced morbidity and mortality surveillance helped to maintain these earlier successes. The shift in focus led to improved capacity of epidemiology and to changes in public health training and programs.

### Quantitative Analytic Techniques

Epidemiology, the population-based study of disease and an important part of the scientific foundation of public health, acquired greater quantitative capacity during the 20th century. Improvements occurred in both study design and periodic standardized health surveys.<sup>12,18–21</sup> Methods of data collection evolved from simple measures of disease prevalence (e.g., field surveys) to complex studies of precise analyses (e.g., cohort studies, case-control

studies, and randomized clinical trials).<sup>12</sup> The first well-developed, longitudinal cohort study was conducted in 1947 among the 28,000 residents of Framingham, Massachusetts, many of whom volunteered to be followed over time to determine incidence of heart disease.<sup>12</sup> The Framingham Heart Study served as the model for other longitudinal cohort studies and for the concept that biologic, environmental, and behavioral risk factors exist for disease.<sup>6,12</sup>

In 1948, modern clinical trials began with publication of a clinical trial of streptomycin therapy for tuberculosis, which employed randomization, selection criteria, pre-determined evaluation criteria, and ethical consideration.<sup>19,21</sup> In 1950, the case-control study gained prominence when this method provided the first solidly scientific evidence of an association between lung cancer and cigarette smoking.<sup>22</sup> Subsequently, high-powered statistical tests and analytic computer programs enabled multiple variables collected in large-scale studies to be measured and to the development of tools for mathematical modeling. Advances in epidemiology permitted elucidation of risk factors for

\* The government, community, professional, voluntary, and academic institutions and organizations that support or conduct public health research or programs.

heart disease and other chronic diseases and the development of effective interventions.

### **Periodic Standardized Health Surveys**

In 1921, periodic standardized health surveys began in Hagerstown, Maryland.<sup>12</sup> In 1935, the first national health survey was conducted among U.S. residents.<sup>12,23</sup> In 1956, these efforts resulted in the National Health Survey, a population-based survey that evolved from focusing on chronic disease to estimating disease prevalence for major causes of death, measuring the burden of infectious diseases, assessing exposure to environmental toxicants, and measuring the population's vaccination coverage. Other population-based surveys (e.g., Behavioral Risk Factor Surveillance System, Youth Risk Behavior Survey, and the National Survey of Family Growth) were devel-

oped to assess risk factors for chronic diseases and other conditions.<sup>24-26</sup> Methods developed by social scientists and statisticians to address issues such as sampling and interviewing techniques have enhanced survey methods used in epidemiologic studies.<sup>12</sup>

### **Morbidity and Mortality Surveillance**

National disease monitoring was first conducted in the United States in 1850, when mortality statistics based on death registrations were first published by the federal government.<sup>23,27</sup> During 1878-1902, Congress authorized the collection of morbidity reports on cholera, smallpox, plague, and yellow fever for use in quarantine measures, to provide funds to collect and disseminate these data, to expand authority for weekly reporting from states and municipal authorities, and to provide forms for collecting data and publishing re-

ports.<sup>15,23,27</sup> The first annual summary of *The Notifiable Diseases* in 1912 included reports of 10 diseases from 19 states, the District of Columbia, and Hawaii. By 1928, all states, the District of Columbia, Hawaii, and Puerto Rico were participating in the national reporting of 29 diseases. In 1951, state and territorial health officers authorized the Council of State and Territorial Epidemiologists (CSTE) to determine which diseases should be reported to the U.S. Public Health Service (PHS).<sup>27</sup> In 1961, the Centers for Disease Control and Prevention (CDC) assumed responsibility for collecting and publishing nationally notifiable diseases data. As of January 1, 1998, 52 infectious diseases were notifiable at the national level.

In the early 1900s, efforts at surveillance focused on tracking persons with disease; by mid-century, the focus had

*(continued on page 16)*

## **National Public Health Week April 3–9, 2000**

National Public Health Week will be recognized in Missouri and around the nation April 3–9, 2000. The theme of National Public Health Week, "Healthy People in Healthy Communities," is also the vision of the Healthy People 2010. Healthy People 2010, the nation's health objectives for the first decade of the new century, were released on January 25, 2000 at the Partnerships for Health in the New Millennium Conference in Washington, D.C. Healthy People objectives have served as the nation's report card for measuring progress in health promotion and disease prevention since the initiative began in 1979.

The Missouri Public Health Association, in collaboration with the Missouri Department of Health and the Colgate Palmolive Company, is coordinating, again this year, hand-washing education in Head Start locations across the state. Last year's effort was very successful in teaching young children healthy habits, as well as raising awareness of local public health efforts. The goal this year is to get all local public health services to participate, and to educate the 15,500 children enrolled in Head Start Education Sites across the state the importance of handwashing as a good health habit.

While most people don't think about it, local public health services have an impact on almost everything we do in a day. From giving immunizations to children, to inspecting restaurants for sanitation, providing birth certificates and testing the quality of well water, public health touches all aspects of our health and safety.

For more information, please contact your local public health service or Mary Jo Hall, Missouri Public Health Association Public Health Week Coordinator at (816) 525-5341.



(continued from page 15)  
changed to tracking trends in disease occurrence.<sup>28,29</sup> In 1947, Alexander Langmuir at the newly formed Communicable Disease Center, the early name for CDC, began the first disease surveillance system.<sup>27</sup> In 1955, surveillance data helped to determine the cause of poliomyelitis among children recently vaccinated with an inactivated vaccine.<sup>28</sup> After the first polio cases were recognized, data from the national polio surveillance program confirmed that the cases were linked to one brand of vaccine contaminated with live wild poliovirus. The national vaccine program continued by using supplies from other polio vaccine manufacturers.<sup>28</sup> Since these initial disease surveillance efforts, morbidity tracking has become a standard feature of public health infectious disease control.<sup>29</sup>

### Public Health Training

In 1916, with the support of the Rockefeller Foundation, the Johns Hopkins School of Hygiene and Public Health was started.<sup>30,31</sup> By 1922, Columbia, Harvard, and Yale universities had established schools of public health. In 1969, the number of schools of public health had increased to 12, and in 1999, 29 accredited schools of public health enrolled approximately 15,000 students.<sup>31,32</sup> Besides the increase in the number of schools and students, the types of student in public health schools changed. Traditionally, students in public health training already had obtained a medical degree. However, increasing numbers of students entered public health training to obtain a primary postgraduate degree. In 1978, 3753 (69%) public health students enrolled with only baccalaureates. The proportion of students who were physicians declined from 35% in 1944–1945 to 11% in 1978.<sup>28,31</sup> Thus, public health training evolved from a second degree for medical professionals to a primary health discipline.<sup>33</sup> Schools of public health initially emphasized the study of hygiene and sanitation; subsequently, the study of public health has expanded into five core disciplines: biostatistics,

epidemiology, health services administration, health education/behavioral science, and environmental science.<sup>30,34</sup>

Programs also were started to provide field training in epidemiology and public health. In 1948, a board was established to certify training of physicians in public health administration, and by 1951, approximately 40 local health departments had accredited preventive medicine and public residency programs. In 1951, CDC developed the Epidemic Intelligence Service (EIS) to guard against domestic acts of biologic warfare during the Korean conflict and to address common public health threats. Since 1951, more than 2000 EIS officers have responded to requests for epidemiologic assistance within the United States and throughout the world. In 1999, 149 EIS officers are on duty.

### Nongovernment and Government Organizations

At the beginning of the century, many public health initiatives were started and supported by nongovernment organizations. However, as federal, state, and local public health infrastructure expanded, governments' role increased and assumed more responsibility for public health research and programs. Today, public health represents the work of both government and nongovernment organizations.

**Nongovernment organizations.** The Rockefeller Sanitary Committee's Hookworm Eradication Project conducted during 1910–1920 was one of the earliest voluntary efforts to engage in a campaign for a specific disease.<sup>35</sup> During 1914–1933, the Rockefeller Foundation also provided \$2.6 million to support county health departments and sponsored medical education reform. Other early efforts to promote community health include the National Tuberculosis Association work for TB treatment and prevention, the National Consumers League's support of maternal and infant health in the 1920s, the American Red Cross' sponsorship of

nutrition programs in the 1930s, and the March of Dimes' support of research in the 1940s and 1950s that led to a successful polio vaccine. Mothers Against Drunk Driving started in 1980 by a group of women in California after a girl was killed by an intoxicated driver and grew into a national campaign for stronger laws against drunk driving.

Professional organizations and labor unions also worked to promote public health. The American Medical Association advocated better vital statistics and safer foods and drugs.<sup>17</sup> The American Dental Association endorsed water fluoridation despite the economic consequences to its members.<sup>9</sup> Labor organizations worked for safer workplaces in industry.<sup>4</sup> In the 1990s, nongovernment organizations sponsor diverse public health research projects and programs (e.g., family planning, human immunodeficiency virus prevention, vaccine development, and heart disease and cancer prevention).

**State health departments.** The 1850 Report of the Sanitary Commission of Massachusetts, authored by Lemuel Shattuck<sup>13,14</sup>, outlined many elements of the modern public health infrastructure including a recommendation for establishing state and local health boards. Massachusetts formed the first state health department in 1889. By 1900, 40 states had health departments that made advances in sanitation and microbial sciences available to the public. Later, states also provided other public health interventions: personal health services (e.g., disabled children and maternal and child health care, and sexually transmitted disease treatment), environmental health (e.g., waste management and radiation control), and health resources (e.g., health planning, regulation of health care and emergency services, and health statistics). All states have public health laboratories that provide direct services and oversight functions.<sup>36</sup>

**County health departments.** Although some cities had local public health boards in the early 1900s, no county

health departments existed.<sup>33</sup> During 1910–1911, the success of a county sanitation campaign to control a severe typhoid epidemic in Yakima County, Washington, created public support for a permanent health service, and a local health department was organized on July 1, 1911.<sup>33</sup> Concurrently, the Rockefeller Sanitary Commission began supporting county hookworm eradication efforts.<sup>17,35</sup> By 1920, 131 county health departments had been established; by 1931, 599 county health departments were providing services to one fifth of the U.S. population<sup>33</sup>; in 1950, 86% of the U.S. population was served by a local health department, and 34,895 persons were employed full-time in public health agencies.<sup>37</sup>

**Local health departments.** In 1945, the American Public Health Association proposed six minimum functions of local health departments.<sup>38</sup> In 1988, the Institute of Medicine defined these functions as assessment, policy development, and assurance, and PHS has proposed 10 organizational practices to implement the three core functions.<sup>39,40</sup> The national health objectives for 2000, released in 1990, provided a framework to monitor the progress of local health departments.<sup>41</sup> In 1993, 2888 local health departments\*\*, representing county, city, and district health organizations operated in 3042 U.S. counties. Of the 2079 local health departments surveyed in 1993, nearly all provided vaccination services (96%) and tuberculosis treatment (86%); fewer provided family planning (68%) and cancer prevention programs (54%).<sup>42</sup>

**Federal government.** In 1798, the federal government established the Marine Hospital Service to provide health services to seamen.<sup>15</sup> To recognize its expanding quarantine duties, in 1902, Congress changed the service's name to the Public Health and Marine Hospital Service and, in 1912, to the Public Health Service (PHS). In 1917, PHS' support of state and local public

health activities began with a small grant to study rural health.<sup>35</sup> During World War I, PHS received resources from Congress to assist states in treating venereal diseases. The Social Security Act of 1935, which authorized health grants to states, and a second Federal Venereal Diseases Control Act in 1938<sup>13,14</sup>, expanded the federal government's role in public health.<sup>15,35</sup> In 1939, PHS and other health, education, and welfare agencies were combined in the Federal Security Agency, forerunner of the Department of Health and Human Services. In the 1930s, the federal government began to provide resources for specific conditions, beginning with care for crippled children. After World War II, the federal role in public health continued to expand with the Hospital Services and Construction Act (Hill-Burton) of 1946.<sup>\*\*\*15</sup> In 1930, Congress established the National Institutes of Health [formerly the Hygiene Laboratories of the Public Health Service] and the Food and Drug Administration. CDC was established in 1946.<sup>29</sup> Legislation to form Medicare and Medicaid was enacted in 1965, and the Occupational Safety and Health Administration and the Environmental Protection Agency were organized in 1970.

Although federal, state, and local health agencies and services have increased throughout the century, public health resources represent a small proportion of overall health-care costs. In 1993, federal, state, and local health agencies spent an estimated \$14.4 billion on core public health functions, 1%-2% of the \$903 billion in total health-care expenditure.<sup>43</sup>

## Conclusion

The public health infrastructure changed to provide the elements necessary for successful public health interventions: organized and systematic observations through morbidity and mortality surveillance, well-designed epidemiologic studies and other data to facilitate the decision-making process, and

individuals and organizations to advocate for resources and to ensure that effective policies and programs were implemented and conducted properly. In 1999, public health is a complex partnership among federal agencies, state and local governments, nongovernment organizations, academia, and community members. In the 21st century, the success of the U.S. public health system will depend on its ability to change to meet new threats to the public's health.

Reported by: Epidemiology Program Office, Office of the Director, CDC.

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\*\*A local health department is an administrative or service unit of local or state government responsible for the health of a jurisdiction smaller than the state.

\*\*\* P.L. 79-725

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## Disease Reporting

Cases of reportable diseases and conditions should be reported promptly to your local health department, or to the Missouri Department of Health at

**(800) 392-0272**

(during working hours)

or

**(573) 751-4674**

(after hours, weekends  
or holidays)

# April is

## National STD Awareness Month

### Did you know.....

- ☞ At least 15% of all infertility cases in American women are caused by pelvic inflammatory disease (PID), which is usually a complication of sexually transmitted diseases.
- ☞ The sexually transmitted diseases (STDs) most often associated with PID are chlamydia and gonorrhea.
- ☞ According to the Centers for Disease Control and Prevention (CDC), chlamydia and gonorrhea rank first and second among the most commonly reported infections in the United States.
- ☞ Because these infections often have no noticeable symptoms, experts estimate that the annual number of new cases is probably much higher than those reported—4 million cases of chlamydia and 800,000 cases of gonorrhea nationwide.
- ☞ Chlamydia occurs without noticeable symptoms in as many as 85% of cases among women and 40% of cases among men.
- ☞ Young people are at the highest risk for all STDs. Two-thirds of the estimated 12 million new STD infections in the United States each year occur in people under 25; one-fourth occur in teenagers.
- ☞ Other possible complications of PID are chronic pain and ectopic, or tubal, pregnancies. In tubal pregnancies, the mother's life is threatened and the fetus cannot develop.
- ☞ Chlamydia and gonorrhea can also cause sterility in men.
- ☞ People who have had unprotected sex should consult a health care provider about getting tested for STDs—even if no symptoms are noticeable. Chlamydia and gonorrhea can be cured with antibiotics, and early detection and treatment of these infections reduces the likelihood of developing PID and its complications.

Source: American Social Health Association

### To find out more.....

- Talk with your health care provider.
- Contact the STD clinic in your local health department.
- Call the National STD Hotline at (800) 227-8922.  
(The hotline is free and open to calls from 7:00 a.m. to 10:00 p.m., Monday through Friday)

Additional information is also available on the Internet at the following sites:

**CDC. Division of Sexually Transmitted Diseases**  
<http://www.cdc.gov/nchstp/dstd/dstdp.html>

**CDC. National Prevention Information Network (NPIN): STD Resources**  
<http://www.cdcnac.org/std/start.htm>

**National Institute of Allergy and Infectious Diseases: NIAID Publications on STDs.**  
<http://www.niaid.nih.gov/publications/stds.htm>

**JAMA. Sexually Transmitted Disease Information Center**  
<http://www.ama-assn.org/special/std/std.htm>

**St. Louis STD/HIV Prevention and Training Center**  
[http://www.umsl.edu/services/itc/std\\_ptc.html](http://www.umsl.edu/services/itc/std_ptc.html)

**National STD/HIV Prevention and Training Center Network**  
<http://www.stdptc.uc.edu/>

**CDC. Division of HIV/AIDS Prevention (DHAP)**  
[http://www.cdc.gov/nchstp/hiv\\_aids/dhap.htm](http://www.cdc.gov/nchstp/hiv_aids/dhap.htm)

**CDC. National Prevention Information Network—HIV/AIDS Resources**  
<http://www.cdcnpin.org/hiv/start.htm>



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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

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## LATE BREAKERS

 **American Academy of Pediatrics (AAP) Recommends That Newborns Be Vaccinated Against Hepatitis B**—The AAP has issued a statement recommending that all infants receive the hepatitis B vaccination between birth and two months of age. According to Margaret B. Rennels, M.D., F.A.A.P., "Resumption of hepatitis B vaccination of young infants is important because confusion about recommendations has resulted in some hospitals failing to immunize children delivered to hepatitis B surface antigen positive women." Thimerosal-free hepatitis B vaccine is now available, and health care providers should now resume hepatitis B vaccination of infants with thimerosal-free vaccine "optimally at birth and no later than two months of age." Dr. Rennels's article was published in the *AAP News* 1999;15(11):6, the official news magazine of the AAP. Dr. Rennels is a member of the AAP Committee on Infectious Diseases.

 **Infection Control Guidelines for Long Term Care Facilities: Emphasis on Body Substance Precautions**—The Section of Communicable Disease Control and Veterinary Public Health is pleased to announce that this manual is now available via the Department of Health web site. The web site address is <http://www.health.state.mo.us/Publications/ICtableconts.html>. This manual is in PDF format, so you will need Adobe Acrobat Reader to open it. Hard copies of the manual, with or without a binder, are available at cost. Please contact the Section of Communicable Disease Control and Veterinary Public Health at (800) 392-0272 for ordering information.



# EPIDEMIOLOGIST

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## Blastomycosis Investigation in Southeast Missouri

Sue Tippen

Southeastern District Health Office

Since 1994, there has been ongoing discussion and concern about the number of blastomycosis cases occurring in southeastern Missouri, especially Mississippi County. In August 1999, a 19-year-old Mississippi County resident died due to blastomycosis. This case brought the total number of known blastomycosis cases occurring since 1992 in Mississippi, New Madrid and Scott counties to 14, with five deaths. It also prompted a request to the Missouri Department of Health's (MDOH's) Section of Communicable Disease Control and Veterinary Public Health for an epidemiologic investigation to determine the number and distribution of blastomycosis cases in southeastern Missouri.

Blastomycosis has not been reportable in Missouri, therefore the prevalence of the disease is unknown. As a starting point for the investigation, a list of positive blastomycosis test results for Missouri patients from 1992-99 was requested from the Tuberculosis Unit of the Missouri Rehabilitation Center (which conducts blastomycosis tests). The list obtained included 37 positive blastomycosis lab results, 20 of which were for patients residing in the following counties located in the Southeastern Health District: Cape Girardeau 1, Scott 2, New Madrid 3, Pemiscot 2 and Mississippi 12 (8 in Charleston, MO). These results prompted a request by MDOH to the Centers for Disease Control

and Prevention's (CDC's) Division of Bacterial and Mycotic Diseases for assistance in investigating the apparent cluster of blastomycosis cases in southeastern Missouri

On January 10, 2000, two Epidemic Intelligence Service (EIS) Officers from CDC arrived in Charleston, MO, to assist in the investigation. A public meeting was held that evening at the Mississippi County Health Department in Charleston to advise the community about the investigation. The meeting included a question and answer session. Approximately 25 individuals attended the meeting.

The subsequent investigation consisted of active case finding and a case/control study. Genetic testing was also performed as an adjunct.

### Case Finding Activities

With the assistance of area hospitals and MDOH staff, 97 blastomycosis cases diagnosed during the period from 1992 to 1999 were identified statewide; 43 were from southeastern Missouri. A decision was made that the study should include the following counties in southeastern Missouri: Butler, Cape Girardeau, Dunklin, Mississippi, New Madrid, Pemiscot, Scott and Stoddard.

### Case/Control Study

An attempt was made to contact all identified blastomycosis cases in southeastern Missouri (including family members of deceased cases), along with

four randomly selected age- and sex-matched controls for each case. Controls had to live in the same city or rural area as the case. A questionnaire was completed for each case and control.

### Genetic Study

MDOH and CDC will be partnering with the National Institutes of Health (NIH) to obtain genetic testing on blood specimens from as many blastomycosis cases as possible. Since little is known about the incidence of blastomycosis, NIH hopes the genetic testing will provide additional information about the disease.

It will take several months to analyze the data obtained from the investigation, and it is unknown if additional risk factors will be identified or major conclusions reached. However, another important goal of the investigation is to raise awareness among health care providers and the general public regarding the

*(continued on page 4)*

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# Heat Surveillance Summary - 1999

*Diane C. Rackers*  
Office of Epidemiology

The summer of 1999 in Missouri started with very comfortable temperatures. However, when the summer was over, Missouri had experienced a two-week heat wave and the highest number of heat-related illnesses and deaths since the great heat wave of 1980. During the summer of 1999, 968 heat-related illnesses and 92 heat-related deaths were reported in Missouri. See Figures 1 and 2.

The Missouri Department of Health issued a statewide Hot Weather Health Advisory on July 20, 1999. See side bar on page 3 for a description of the three advisory stages. The heat index on July 19 had been 110 in St. Louis, 107 in Kansas City, 104 in Columbia, 102 in Springfield and 105 in Cape Girardeau. The advisory was upgraded to a statewide Hot Weather Health Warning the next day when high heat indexes continued. Missouri remained under a statewide Hot Weather Health Warning until August 3 when heat indexes had dropped considerably. During this heat wave, there were eight days in a row when the heat index ranged from 105–119 statewide. The 13-day heat wave accounted for 68 percent (655/968) of the heat-related illnesses and 86 percent (79/92) of the heat-related deaths that occurred in 1999. The majority of the heat-related deaths occurred during the latter half of the nearly two-week heat wave. See Figure 3.

The first peak of heat-related illnesses and deaths in 1999 occurred from July 4–7 when the first wave of high heat indexes occurred in Missouri. An increase in heat-related illnesses in mid-August included approximately 100 high school band members treated for heat-related illness at the Missouri State Fair on August 12 when heat indexes reached a one-day peak with a heat index of 118 in St. Louis, 106 in Kansas City, 112 in Columbia, 112 in Springfield and 120 in

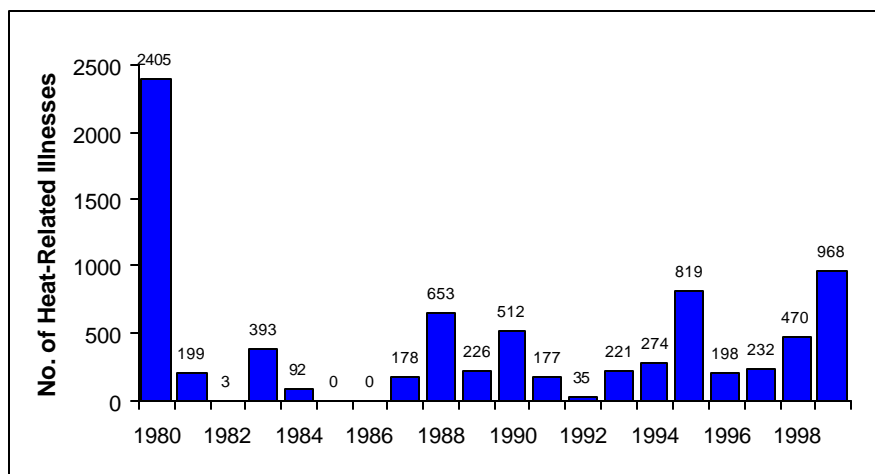


Figure 1. Reported heat-related illnesses by year, Missouri, 1980–99.

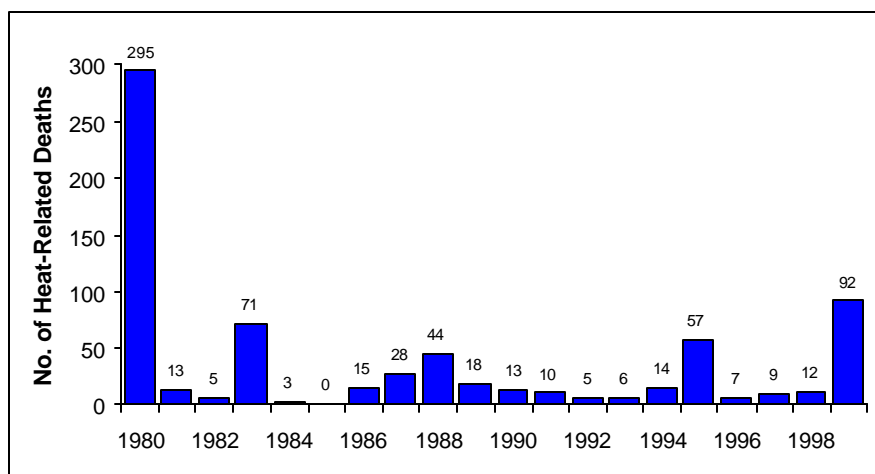


Figure 2. Recorded heat-related deaths by year, Missouri, 1980–99.

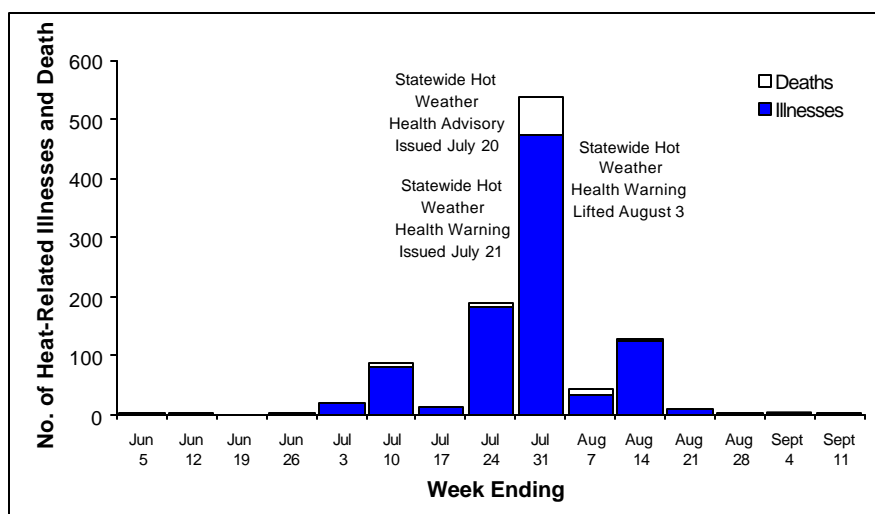


Figure 3. Reported heat-related illnesses and recorded heat-related deaths by week of occurrence, Missouri, Summer 1999.

Cape Girardeau. By the following day, heat indexes had dropped to below 85 for all areas except Cape Girardeau.

In 1998, one statewide Hot Weather Health Advisory was issued on June 25 and a statewide Hot Weather Health Warning was issued on July 20. In 1998, 470 heat-related illnesses and 12 heat-related deaths were reported in Missouri.

There are two distinct types of heat-stroke. Both are characterized by extreme hyperthermia and multiple metabolic and hemodynamic abnormalities, but they arise in very different clinical settings.<sup>1</sup>

### Classic Heatstroke

Occurring primarily in epidemics during summer heat waves, classic heatstroke is most likely to affect the elderly and patients with serious underlying illnesses. Infants are also at risk. The urban poor are particularly vulnerable. The typical victim is confined at home without benefit of air conditioning or fans. Hence, when extreme ambient heat and humidity impair the body's ability to lose heat by radiation and evaporation, body temperature rises. Dehydration—common in the elderly—is an important predisposing factor. Other risk factors include obesity, neurologic or cardiovascular disease, and use of diuretics, neuroleptics or medications with anticholinergic properties that interfere with sweating. Alcohol use may be a risk factor.<sup>1</sup>

### Exertional Heatstroke

Like classic heatstroke, exertional heatstroke occurs during hot, humid weather. Typically, however, it occurs sporadically, affecting healthy young persons engaged in strenuous physical activity. In the United States, athletes, military recruits and industrial workers are at greatest risk. Predisposing factors include lack of acclimatization to the heat, lack of cardiovascular conditioning, heavy clothing and dehydration.<sup>1</sup>

Of the 92 heat-related deaths in 1999, 68 (74%) were in individuals aged 65 or older. Of those 68 elderly deaths, 63

**Department of Health**  
**Stages of Hot Weather Health Advisories**

A statewide **Hot Weather Health Advisory** will be issued when heat indexes of 105° in a large proportion of the state are first reached (or predicted). The Department of Health will inform the public about the risks of heat-related illness and urge concern for those at high risk. Monitoring of temperatures and heat indexes will be intensified. An **Advisory** will not be canceled.

A statewide **Hot Weather Health Warning** will be issued when:

1. Heat indexes, measured at peak afternoon temperatures, have remained at 105° or more for two days in a large proportion of the state **and**
2. When weather predictions are for continued high-stress conditions for at least 24-48 hours in a large proportion of the state.

During a **Warning**, the Department of Health will encourage local health departments to assure that cooling shelters are available and also encourage other community agencies to provide relief from the heat stress. A **Warning** will be downgraded or canceled when heat indexes in a large proportion of the state fall below 105° for 48 hours and the forecast is for 48–72 hours of continued relief from heat stress.

The Department of Health will recommend to the Governor that a statewide **Hot Weather Health Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); **and**
2. Surveillance data demonstrate increased levels of heat-related illness and death statewide; **and**
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days in a large proportion of the state.

An **Emergency** will be canceled when the heat indexes in a large proportion of the state fall below 105° for 48 hours and the National Weather Service predictions indicate a low probability for the return of severe conditions for the following 48 to 72 hours.

(93%) occurred inside residences and would meet the criteria of a classic heatstroke: 24 (38%) had no air conditioning, 19 (30%) had an air conditioner but would not use it, 11 (17%) had an air conditioner that was not working properly, and availability of air conditioning is unknown for 9 (14%) deaths. Of the 63 deaths, 35 (56%) were from the St. Louis area and 15 (24%) were from Kansas City.

During prolonged periods of high temperatures, air conditioning is the best preventive measure. The elderly and chronically ill are especially more vulnerable to heat because they may perspire less and are more likely to have health problems requiring medications that impair the body's natural defenses to adjust to heat. Most of the elderly were found in homes with fans blowing

*(continued on page 4)*

(continued from page 3)

and windows closed. For some, even encouragement from relatives and friends could not convince them to use their air conditioners. Many did not or could not pay the high electric bill associated with air conditioning, while others stated they had made it through other hot summers without air conditioning or that the cold bothered their arthritis. One elderly individual was found in his home with the windows closed and still wearing thermal underwear.

Electric fans may be useful to increase comfort and to draw cool air into the home at night, but should not be relied on as the primary cooling device during a heat wave. When the temperature is in the upper 90s or higher, a fan will deliver overheated air to the skin at a rate that exceeds the capacity of the body to get rid of the heat, even with sweating, and the net effect is to add heat rather than to cool the body. The better alternative by far when the temperature soars is to use an air conditioner if one is available or to seek shelter in an air-conditioned building.

Of the 68 elderly deaths, five (7%) occurred outside. Three of those deaths would meet the criteria of an exertional heatstroke: one individual died working in the field on a tractor, another was mowing an embankment and the other was fixing a fence.

Of the 92 heat-related deaths in 1999, 24 (26%) were under age 65, ranging from 37 to 64 years old. Of those 24 deaths, 18 (75%) occurred inside residences and would meet the criteria of a classic heatstroke: 15 (83%) had no air conditioning, one (6%) had an air conditioner but would not use it and availability of air conditioning is unknown for two (11%) deaths. Most of these individuals were on medications for health conditions or were known to consume excessive amounts of alcohol. Of the 18 deaths, 7 (39%) were from the St. Louis area and 5 (28%) were from Kansas City.

Of the 24 deaths in those under 65, six (25%) occurred outside. One of these deaths might be classified as an exertional heatstroke; the individual had been exercising excessively outside. Two of the six deaths were in homeless individuals, two individuals fell outside due to excessive consumption of alcohol and one was sunbathing while consuming alcohol.

Weather forecasts call for another hot, dry summer in 2000. Therefore, the Missouri Department of Health encourages health care providers to reemphasize to patients preventive measures to reduce heat-related illness during prolonged hot weather:

- Avoid direct sunlight.
- Stay in coolest location available.
- Spend time in an air-conditioned place.
- Place wet towels or ice bags on the body or dampen clothes.
- Take cool baths or showers frequently.
- Reduce the number of layers of clothing.
- Wear lightweight, loose-fitting garments.
- Avoid strenuous physical activity and reschedule activities, such as shopping, to a cooler time of day.
- Increase intake of fluids such as water and juices.
- Avoid alcoholic beverages (beer, wine or liquor).
- Contact family or friends at least once a day.
- Check to see if medications you take affect the body's response to heat.
- Never leave infants, children or pets unattended in a parked car or other hot environment.

Health care providers who become aware of heat-related illnesses or deaths, are asked to report them promptly to their local public health agencies.

Further information on prevention of heat-related illness and past surveillance data for Missouri is available through

the Department of Health web site at <http://www.health.state.mo.us/ColdAndHeat/CAndH.html> or by calling the Office of Epidemiology at (573) 751-6128.

#### REFERENCE:

1. Simon HB. Hyperthermia and Heatstroke. *Hosp Pract*; August 15, 1994: 65-80.

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## Blastomycosis Investigation

(continued from page 1)

presence of blastomycosis in southeastern Missouri. Such increased awareness is intended to promote the early recognition of the signs/symptoms of the disease, as well as to emphasize the need for individuals to promptly seek medical attention should such signs/symptoms occur.

A blastomycosis fact sheet is printed on pages 5-6 of this issue. MDOH encourages health care providers to distribute copies of the fact sheet to patients/clients who are at-risk for acquiring blastomycosis, including men 30-59 years of age, and individuals with outdoor exposure during work, such as farmers and forestry workers, or individuals participating in recreational activities in wooded areas and along waterways.

A rule revision is in process that will add blastomycosis to the list of reportable diseases. To support the investigation, health care providers are strongly encouraged to report cases of blastomycosis to their local public health agency within three days of first knowledge or suspicion. Cases can also be reported to MDOH's Section of Communicable Disease Control and Veterinary Public Health at (573) 751-6113 or (800) 392-0272.

## **Blastomycosis Fact Sheet**

### **What is blastomycosis?**

Blastomycosis is a disease caused by a fungus that grows in moist soils, particularly wooded areas along waterways and in undisturbed places like under porches or sheds.

### **Who gets blastomycosis?**

Studies have shown that the risk for disease may be greater among middle-aged men, 30–59 years of age. Also at greater risk are those with outdoor exposure during work such as farmers and forestry workers or during recreational activities in wooded areas and along waterways. Exposure to soil has also been associated with risk of illness.

### **How do you get blastomycosis?**

You get blastomycosis by breathing dust that contains fungal spores. The disease also occurs in dogs, cats and other animals. It is not transmitted from animals to people or from person-to-person.

### **How long after exposure to the fungus do symptoms start?**

It takes from 3 weeks to 3 months, but symptoms will usually start within 45 days.

### **What are the symptoms of blastomycosis?**

The disease may present with sudden onset of fever or cough, and can resolve after 1–3 weeks of illness. But, more commonly, the onset is slow and the disease becomes chronic (long-lasting) and spreads from the lungs, causing skin sores usually on the face and fingers. It may also cause weight loss, weakness and low-grade fever. If untreated it can result in death.

### **How is blastomycosis diagnosed?**

A physician should be seen for testing and diagnosis.

### **Can blastomycosis be treated?**

Yes, the disease can be treated with medication prescribed by your physician.

### **How can blastomycosis be prevented?**

Prevention measures are unknown. However, activities which bring individuals closer to rotting wood and exposure with the soil such as hunting, fishing, or playing in soil near water may be associated with a greater risk of developing blastomycosis.

If symptoms occur, see a physician immediately. If you change physicians during the illness, be sure you tell the new physician what your symptoms were then and what medication you were given.

**Early diagnosis and treatment are important to prevent serious illness and death.**

For more information about blastomycosis, ask your physician or health care provider or contact:

**Missouri Department of Health  
Section of Communicable Disease Control  
and Veterinary Public Health  
Ph: (573) 751-6113  
or (800) 392-0272**

February 2000



MISSOURI DEPARTMENT OF

**HEALTH**

# Toll Free Numbers

TEAR OUT FOR FUTURE REFERENCE

5-Day-Program .....	(800) 316-0935
Asbestos .....	(800) 392-7245
Arthritis/Osteoporosis Education Program .....	(800) 316-0935
Cardiovascular Health Program .....	(800) 316-0935
Certified Occupational Rehabilitation Facilities Complaints and Information ...	(800) 877-6485
Child and Adult Care Food Program .....	(800) 733-6251
Childhood Lead Poisoning Program .....	(800) 575-9267
Children With Special Health Care Needs .....	(800) 451-0669
Communicable Disease Control .....	(800) 392-0272
Communicable Disease Case and Outbreak Reporting .....	(800) 392-0272
Cystic Fibrosis .....	(800) 451-0669
Diabetes Program .....	(800) 316-0935
Disabilities Prevention .....	(800) 877-6246
Environmental Public Health .....	(800) 392-7245
First Steps Program .....	(800) 451-0669
Foodborne Illness Investigation .....	(800) 392-7245
Genetic Diseases .....	(800) 877-6246
Hazardous Wastes .....	(800) 392-7245
Head Injury Program .....	(800) 451-0669
Healthy Children and Youth Program .....	(800) 451-0669
Hemophilia .....	(800) 451-0669
HIV/STD Information HOTLINE for State of Missouri .....	(800) 359-6259
Home Health Complaints and Information .....	(800) 877-6485
Hospice Complaints and Information .....	(800) 877-6485
Immunization Requirements .....	(800) 699-2313
International Travel Recommendations .....	(800) 699-2313
Injury Control Program .....	(800) 877-6246
Lead Licensing and Accreditation .....	(888) 837-0927
Lead Poisoning in Children .....	(800) 575-9267
Minority Health Issues .....	(800) 877-3180
Newborn Screening Program .....	(800) 877-6246
Nosocomial Infection Reporting .....	(800) 392-0272
Occupational Fatality HOTLINE .....	(800) 392-7245
Occupational Physical Therapy Clinic Complaints and Information .....	(800) 877-6485
On-Site Sewage Systems .....	(800) 392-7245
Organ Donor Program .....	(888) 497-4564
Physician Loan Repayment .....	(800) 891-7415
Primary Care Resource Initiative for Missouri (PRIMO) .....	(800) 891-7415
Professional and Practical Nurse Student Loan Program .....	(800) 891-7415
Radon HOTLINE .....	(800) 669-7236
Refugee Health Program .....	(800) 611-2912
Rural Health .....	(800) 891-7415
SAFE KIDS .....	(800) 877-6246
Sickle Cell Anemia .....	(800) 877-6246
Summer Food Service Program .....	(888) 435-1464
TEL-LINK .....	(800) 835-5465
Tuberculosis Control .....	(800) 611-2912
Vaccine-Preventable Diseases .....	(800) 699-2313
Vaccines for Children Program .....	(800) 219-3224
Veterinary Public Health .....	(800) 392-0272
Well Water Testing .....	(800) 392-7245
WIC Program .....	(800) 392-8209

# Bureau of Special Health Care Needs

Deborah White

Melinda Sanders

Bureau of Special Health Care Needs

The Bureau of Special Health Care Needs provides service coordination and financial assistance through a variety of programs such as the Adult Genetics Treatment Program and the Children with Special Health Care Needs Program.

## Adult Genetics Treatment Program

This program assists Missouri residents 21 years of age and older who meet both medical and financial eligibility requirements. Medical eligibility is documented with a written diagnosis of

- Hemophilia
- Sickle Cell Anemia or
- Cystic Fibrosis.

## Children with Special Health Care Needs Program

This program provides early identification and health services for participants

from birth until the age of 21 years, who meet both medical and financial eligibility. Coverage restrictions apply to specific conditions. Medical conditions covered include but are not limited to:

- Arthritis
- Burns
- Cardiac
- Cerebral Palsy
- Cleft Lip and Palate
- Cystic Fibrosis
- Genitourinary
- Hearing
- Hemophilia
- Neurology
- Orthopedic
- Sickle Cell Anemia
- Seizures
- Spina bifida.

Both programs provide assistance for the following treatment-related services:

- Inpatient Care
- Outpatient Care


- Home Medical Equipment
- Emergency Care
- Prescription Medications and
- Blood Factor Products.


Financial eligibility for both the Adult Genetics Treatment Program and the Children with Special Health Care Needs Program is based on the U.S. Department of Health and Human Services Poverty Income Guidelines. Families or individuals whose income is at or below 185 percent of the Poverty Income Guidelines are considered financially eligible.

Both adult and children programs offer service coordination services as a benefit of participation. Service coordination is a collaborative process, which assists individuals and/or families in identifying, planning, and locating medical, and other health related services.

For additional information regarding these or other programs offered by the Bureau of Special Health Care Needs, please call (573) 751-6246 or (800) 451-0669.

## LATE BREAKERS

 **Immunization Videoconference Date Change**—The date for **Preparing for the Next Influenza Pandemic (Part II)** videoconference has been changed from June 22 to July 13, 2000. For more information about this course, please contact the immunization representative in your district health office or the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313.

 **Emergency Rule Changes**—The Missouri Department of Health is promulgating emergency amendments to the following rules: 19 CSR 20-20.010, Definitions Relating to Communicable, Environmental and Occupational Diseases; 19 CSR 20-20.020, Reporting Communicable, Environmental and Occupational Diseases; 19 CSR 20-26.030, Human Immunodeficiency Virus (HIV) Test Consultation and Reporting; 19 CSR 20-26.040, Physician Human Immunodeficiency Virus (HIV) Test Consultation and Reporting.

In addition, the department is rescinding 19 CSR 20-20.080, Duties of Laboratories, and promulgating an emergency rule of the same name and number. The emergency amendments/rule will become effective by the end of April 2000 and will be printed in the May 15th edition of the *Missouri Register*. The *Missouri Register* may be accessed through the Missouri Secretary of State home page at <http://mosl.sos.state.mo.us/moreg/moreg.htm>.

If you have questions about these rule changes, please contact the Office of Surveillance at (573) 751-9071.

# Missouri Statewide Food Service Survey, 1998

Patrick E. Phillips, D.V.M., M.S.P.H.  
Office of Epidemiology

Lori Harris-Franklin

David Stull, R.S.

Section for Environmental Public Health

In the fall of 1998, the Missouri Department of Health (MDOH) conducted a statewide survey of 1,200 randomly selected food service establishments (FSEs) to determine the baseline level of factors affecting food safety, and to identify public health needs in the state's food service industry. An inventory of FSEs in Missouri was compiled from lists obtained from local public health agencies. Penal, day care, seasonal and private food services were excluded. A random sample of FSEs was then surveyed by a team of MDOH environmental public health specialists. All members of the survey team had previously completed Hazard Analysis and Critical Control Points (HACCP) training, and were experienced in MDOH inspection methodology and the use of MDOH inspection forms. The survey included an on-site inspection and completion of a questionnaire. The statistical power of the survey design was determined to be a confidence level of greater than 99%, with a 3% sample error.

Table 1 shows the types and numbers of FSEs surveyed, and the average number of critical and non-critical defects in the handling and preparation of food items

observed in each type of establishment. Restaurants comprised 54.1 percent of all the FSEs surveyed, and had the highest average number of observed critical and non-critical defects (3.35 and 11.36, respectively). Caterers had the lowest average number of observed critical defects (1.31).

Each FSE was questioned regarding a number of variables potentially associated with the presence or absence of defects in food handling and preparation, but only two of these variables were found to have a statistically significant relationship to a lower average number of critical defects: 1) A history of the respondent having received **formal training in food safety**, and 2) Documentation at the local public health agency indicating the facility had received a **follow-up food service inspection** after being previously identified by an inspector as having one or more critical defects in food handling and preparation.

Schools and senior citizen nutritional sites had consistently higher levels of food safety training, and this was associated with the presence of lower average numbers of critical defects in these sites compared with most other types of FSEs.

No significant relationship was observed between the average number of meals served per day, or the average number of

employees, and the average number of critical defects. That is, there was no evidence that small FSEs would be more, or less, likely to have critical defects than large FSEs.

The results were analyzed according to whether the surveyed FSEs were in jurisdictions that had local food service ordinances. Of the 1,200 establishments surveyed, 786 (65.5%) were in areas that had such ordinances, and 414 (34.5%) were in areas that did not have these ordinances. No significant difference in the average number of critical defects was observed between these two sets of establishments. It was noted that, on average, routine inspection cycles were shorter in jurisdictions with food service ordinances than in jurisdictions without these ordinances. The fact that this difference in inspection intervals was not associated with a significant difference in the average number of critical defects suggests that the time sequence of routine inspections may be dictated more by regulatory requirements than by identified risks to food safety.

The results were also analyzed according to whether the FSEs surveyed were in metropolitan or non-metropolitan areas. Of the 1,200 surveyed establishments, 706 (58.8%) were in metropolitan areas, and 494 (41.2%) were in non-metropolitan areas. There was no significant difference in the average number of critical  
(continued on page 11)

**Table 1. Types, Numbers, and Percentages of Food Service Establishments Surveyed, and Average Numbers of Critical and Non-critical Defects Observed, MDOH Statewide Food Service Survey, 1998.**

Type of Food Service Establishment	Numbers and Percentages Surveyed	Average Number of Critical Defects	Average Number of Non-Critical Defects
Restaurant	649 ( 54.1%)	3.35	11.36
School	144 ( 12.0%)	2.17	5.72
Convenience Store	126 ( 10.5%)	1.89	7.36
Tavern	120 ( 10.0%)	2.25	8.26
Deli	87 ( 7.3%)	2.56	6.87
Senior Citizen Nutritional Site	22 ( 1.8%)	2.05	7.14
Caterer	16 ( 1.3%)	1.31	7.19
Other	36 ( 3.0%)	1.42	6.56
<b>TOTAL</b>	<b>1,200 (100.0%)</b>	<b>2.78</b>	<b>9.35</b>

# Salmonella typhimurium Outbreak Associated With Young Poultry

Marion Warwick, M. D., M.P.H.  
Marge Borst, R.N., B.S., C.I.C.  
Stephanie Wiedlocher  
Section of Communicable Disease  
Control and Veterinary Public Health

## Introduction

Although the majority of reported salmonella cases are acquired through foodborne transmission, it is important to remember that pets such as poultry and reptiles can also serve as vectors for disease.<sup>1-7</sup> This article describes risk factors for transmission in a 1999 salmonella outbreak in Missouri associated with young poultry purchased for Easter. For persons who handled young poultry such as chicks and ducklings, handwashing was found to be highly protective in preventing salmonella infection.

In April 1999, the Missouri Department of Health noted a cluster of nine *Salmonella typhimurium* cases (serotype 051). Cases were scattered throughout the state; seven of the nine cases were under age seven. Histories revealed no common food sources, but uncovered a common theme of exposure to pet chicks or ducklings purchased for the Easter season. Further investigation ensued.

An outbreak-associated case was defined as a Missouri resident with culture-confirmed *Salmonella typhimurium* 051 serotype, reported from April 4 to May 30, 1999. Of 40 cases that met this definition, 32 (80%) reported exposure to some form of young poultry. Sources of poultry associated with Missouri cases were traced back to two hatcheries. In cooperation with the Missouri Department of Agriculture, these hatcheries were inspected and found to have good sanitary and production process; cultures of feed and feces were subsequently negative. The outbreak was declared over at the end of May, and a case control study

**Table 1. Characteristics of Ill and Not Ill Persons, *Salmonella typhimurium* Outbreak Associated With Young Poultry, Missouri, March 1999**

Characteristic	Cases		Controls		Total	
	n	%	n	%	n	%
<b>Age</b>						
1-7	10	(50)	20	(50)	30	(50)
8-14	5	(25)	10	(25)	15	(25)
15-50	5	(25)	10	(25)	15	(25)
<b>Sex</b>						
Female	8	(40)	27	(68)	35	(58)
Male	12	(60)	12	(30)	24	(40)
Unknown	0	(0)	1	(3)	1	(2)
<b>Total</b>	<b>20</b>	<b>(100)</b>	<b>40</b>	<b>(100)</b>	<b>60</b>	<b>(100)</b>

**Table 2. Species of Poultry Obtained by Ill and Not Ill Persons, *Salmonella typhimurium* Outbreak Associated With Young Poultry, Missouri, March 1999**

Poultry Obtained	Ill		Not Ill		Total	
	n	%	n	%	n	%
Chicks	15	(37)	26	(63)	41	(100)
Ducklings	9	(29)	22	(71)	31	(100)
Goslings	-	--	2	(100)	2	(100)
Turkeys	-	--	5	(100)	5	(100)
<b>Total</b>	<b>24</b>	<b>(30)</b>	<b>55</b>	<b>(70)</b>	<b>79</b>	<b>(100)</b>

Note: Because some families purchased more than one species of poultry, there are more poultry than human subjects; illness refers to illness in humans.

was initiated to provide some answers to questions about mechanisms of transmission and risk factors for illness.

## Methods

Questionnaires included questions about type of poultry and place of purchase, frequency of handling, personal hygiene, and housing of poultry. Twenty of the cases in the original outbreak were selected to represent the state geographically, and 40 new controls without illness who had also purchased poultry were obtained through media advertisements and word of mouth and matched by age range to cases. Participants were interviewed by phone, and data were analyzed using Epi Info 6.02b.

## Results

Study subjects were mostly in the younger age groups with a range of 1-50 years of age; 30 (50%) were under the age of 8, and 15 (25%) were over the age of 14; 35 (58%) were females and 24 (40%) were males. See Table 1.

Although seven families purchased other kinds of poultry (5 goslings and 2 turkeys), the majority of young poultry were either chicks (41) or ducklings (31). There was no illness among persons who had purchased goslings (2) or turkeys (5); but 15 (37%) of those purchasing chicks and 9 (29%) of those purchasing ducklings were ill. See Table 2.

**Table 3. Characteristics Associated With Illness, *Salmonella typhimurium* Outbreak Associated With Young Poultry, Missouri, March 1999\***

<u>Risk Factors</u>	<u>Ill</u>	<u>Not Ill</u>	<u>OR</u>	<u>CI</u>	<u>p-value</u>
Washed hands	6	31	0.00	0.00, 0.18	0.000
Still have poultry	6	32	0.11	0.03, 0.43	0.000
Kissed poultry	1	16	0.11	0.00, 0.99	0.018
Handled poultry daily	14	20	2.80	0.73, 11.17	0.074
Kept poultry outside	6	5	3.00	0.65, 14.16	0.099
Cleaned up after poultry	5	3	4.11	0.71, 25.87	0.073
Poultry died in 2 weeks	7	1	21.00	2.10, 508.1	0.000

\*Please note when interpreting these figures that the number of subjects in the study was small.

Risk factors for illness are described in Table 3. Handwashing was the most protective behavior for prevention of illness (OR 0.0, CI 0.0, 0.18), followed by still having the young poultry at the time of the study (OR 0.11, CI 0.03, 0.43). Kissing the young poultry was found to be protective, but this factor was highly associated with handwashing, as those who kissed the poultry were also more likely to wash their hands. Poultry dying within two weeks of purchase was significantly associated with illness (OR 21.0, CI 2.1, 508.1). Cleaning up after the poultry, keeping the poultry outside, and frequency of handling were also associated with illness, but these risk factors were less statistically significant. See Table 3.

### Conclusions

The findings from the study were consistent with biologic plausibility. Young poultry have the potential for the transmission of disease to humans, and this risk was markedly higher if the young poultry died. There was a trend for association of illness with increased contact with poultry (handling or cleaning). Handwashing was found to be protective even with a contact such as kissing the young poultry. Persons purchasing young poultry should be encouraged to pay attention to personal hygiene, particularly handwashing.

### Public Health Interventions

To address these concerns, the Missouri Department of Health has developed an informational brochure to be distributed

with young poultry, for both mail-order and retail stores, and a press release will be issued prior to the Easter season in the spring of 2000. An article will also be published in the Centers for Disease Control and Prevention's Morbidity and Mortality Weekly Report.

For more information, please contact the Section of Communicable Disease Control and Veterinary Public Health at (800) 392-0272.

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## Food Service Survey

(continued from page 9)

defects between these two sets of establishments.

Finally, the majority of critical defects identified on inspection were "behavioral," i.e., directly caused by human action, or lack thereof. "Behavioral" type critical defects are thought to be best remedied by training activities (education with an emphasis on behavior modification).

### Conclusions

The statewide food service survey conducted by MDOH in 1998 provided a useful way to identify factors associated with the occurrence of critical defects in food handling and preparation in FSEs in Missouri. Results of the survey indicate that two specific interventions may be beneficial in reducing the numbers of critical defects in these establishments: 1) Increased training of food service workers and 2) Consistent provision of follow-up inspections of FSEs where prior inspections have found critical defects.

If you have questions about this survey, please contact the Office of Epidemiology at (573) 751-6128.



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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

## Upcoming Conference

# THE ESSENTIALS OF INFECTION CONTROL 10TH ANNUAL CONFERENCE

### Purpose:

This conference is a **STARTING POINT** to prepare health-care professionals as facilitators and resource persons in the prevention and control of common nosocomial infections. It will aid the professional **new to the responsibilities of infection control** to manage the everyday responsibilities of infection surveillance, analysis of disease data, and problem identification and resolution. Important resources for assistance will also be shared.

### Sponsors:

Missouri Hospital Association, E & R Trust, Missouri Department of Health and Missouri APIC Chapters

### Registration:

For a complete conference brochure, registration form, or questions, contact Rita Kay at (573) 893-3700.

September 20–22, 2000

Capitol Plaza Hotel, Jefferson City, MO

### You Should Attend If You Are A:

Healthcare professional **new** to the field or to the tasks of an infection control professional, or who assists with:

- the infection control program in any healthcare setting (acute care, ambulatory care, home health, long-term care, mental health, public health, rehabilitation, other)
- consultation on infectious disease prevention and control
- outbreak investigation and follow-up
- surveys, investigations or licensing activities relevant to infection control practices.

## Animal Rabies Surveillance – 1999

Howard L. Pue, D.V.M., M.S.V.P.M.  
Office of Surveillance

During 1999, 31 cases of animal rabies were detected in Missouri, compared to 42 cases the previous year, representing a 26 percent decrease. See Figure 1. Animals found to be rabid in Missouri during 1999 included: bats (15 cases); skunks (11 cases); cats (2 cases); horses (1 case); raccoons (1 case); cattle (1 case). The number of specimens tested in 1999 was 2,730, with 31 found positive, giving a positivity rate of 1.14 percent. In 1998, 42 of 2,448 submitted specimens tested positive, yielding a 1.72 percent positivity rate. The annual number of rabies cases during the preceding ten years (1989–1998) ranged from a low of 26 cases in 1996 to a high of 62 cases in 1989. The median number of cases per year during this time period was 31. Rabies is endemic throughout Missouri and the number of cases observed in 1999 appears to represent part of the normal fluctuation of this disease.

Cases of bat rabies occurred throughout the state and most of the incidents in which the bat was speciated involved the Big Brown Bat. The median number of bat rabies cases per year during the preceding ten years was 13. There is not an epidemic of bat rabies in Missouri, although media coverage has increased the notoriety of this animal as a potential vector for rabies. Nationally, rabies in bats accounted for 12.5 percent of all cases of rabies in animals reported in 1998 (most recent data), and the 992 reported cases represented a 3.6 percent

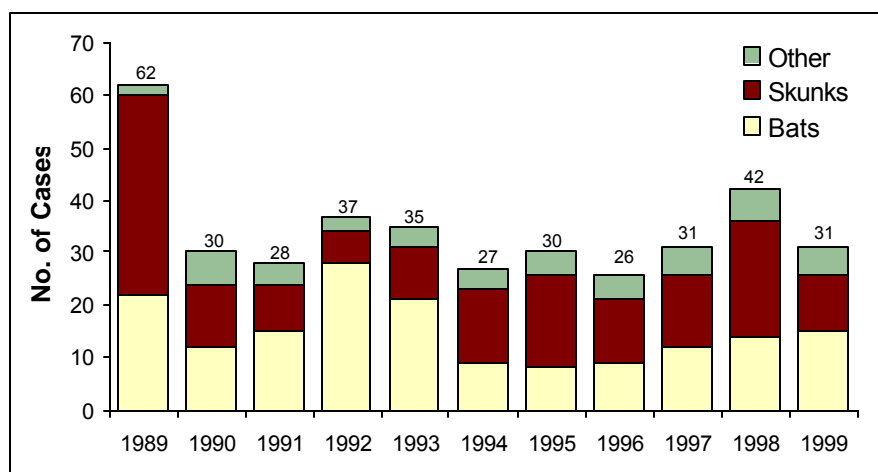


Figure 1. Confirmed animal rabies cases by year and species, Missouri, 1989–99.

increase over those reported in 1997. Over the past 20 years, annual laboratory confirmation of bat rabies in the United States has fluctuated from 600 to 1,000 cases. Rabies is widely distributed throughout the United States, with all states except Alaska, North Dakota, Vermont and Hawaii reporting cases in 1998.

In June of 1999, a raccoon that had been kept in an animal care facility in St. Louis County developed symptoms compatible with rabies. The brain was submitted to the Missouri State Public Health Laboratory (SPHL) for rabies testing and results were positive. A brain tissue sample was forwarded to the Kansas State University (KSU) laboratory for rabies virus variant determination. Neither KSU nor the Centers for Disease Control and Prevention (CDC) was able to confirm the positive result obtained by the SPHL (neither KSU nor CDC

called the result “negative”). The Missouri Department of Health considers this raccoon to have been rabid since the SPHL’s results were obtained using standard tests that have historically provided reliable results for specimens submitted within the state.

(continued on page 2)

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The inability of KSU and CDC to confirm these results could be due to factors such as deterioration of the sample or slight differences in testing techniques due to variations in local circulating strains of rabies virus. This raccoon was most likely infected with a strain of rabies virus endemic to Missouri (e.g., skunk, bat) and not with the eastern strain of raccoon rabies virus.

Data are not currently available concerning the rabies virus variants involved with specimens that tested positive in Missouri during 1999. There is no reason to believe that strains circulating in 1999 differed appreciably from recent previous years. A detailed description of rabies virus variants found in Missouri in 1998 was published in the May-June 1999 issue of the *Missouri Epidemiologist*.

Nationally, the reported number of animal rabies cases was down 6.5 percent from 8,509 cases in 1997 to a total of 7,961 cases in 1998 (latest available data). Wild animals accounted for 7,358 cases or 92.4 percent of all rabies cases. Major types of wild animals infected included raccoons (3,502 cases, 44.0%), skunks (2,272 cases, 28.5%), bats (992 cases, 12.5%), and foxes (435 cases, 5.5%). Other rabid wild animals included 63 groundhogs, 35 mongooses, 35 bobcats, 8 coyotes, 3 beavers, 3 deer, 3 opossums, 2 rabbits, 1 bison, 1 elk, 1 otter, 1 ringtail, and 1 wolf. No further discernible westward extension of the epizootic of rabies in raccoons in Ohio was reported. Domestic animals accounted for 603 (7.6%) of the 7,961 cases seen in 1998. Of that total, 282 cases (3.5%) occurred in cats, 116 cases (1.5%) were seen in cattle, and dogs accounted for 113 cases (1.4%). A total of 82 cases were reported in equidae (horses, donkeys, and mules), which represented a 74.5% increase over the 47 cases reported during 1997 and the greatest number of reported cases in this group of animals since 1981 (88 cases). Other reported cases of rabies in domestic animals included six goats, two sheep, one ferret, and one swine.

## Rabies Prevention and Control

- All animal bites should be medically evaluated.
- Keep vaccinations up-to-date for cats, dogs and ferrets.
- Keep pets under supervision so that they do not encounter wildlife.
- Call the local animal control agency to remove stray animals.
- Spay or neuter pets to help reduce the number of unwanted animals.
- Avoid direct contact with unfamiliar animals.

One case of human rabies occurred in the United States during 1998 compared to four cases in 1997. On December 31, 1998, a 29-year-old male inmate at a correctional institution died from rabies encephalitis in Richmond, VA. The man developed symptoms compatible with rabies on December 14 while working on a roadside cleanup crew. His condition worsened over the next two weeks, and samples sent to CDC tested positive for the rabies virus variant associated with silver-haired and eastern pipistrelle bats. Epidemiologic investigations failed to elicit a history of animal bite, although an unnoticed bite sustained during ignored or forgotten contact with a bat remains the most plausible explanation for this infection. This death continued the trend for human deaths from rabies of indigenous origin; it was associated with bat variants of the rabies virus, and it lacked a clear exposure history involving animal bite.

Each potential exposure to rabies should be evaluated by a physician since this disease is almost invariably fatal in humans. See sidebar. Consultation with local or state public health officials may be required to determine the need for rabies prophylaxis. Administration of rabies postexposure prophylaxis (PEP) should be regarded as a medical urgency, not a medical emergency. The following factors should be considered when determining the need for PEP:

### • Type of Exposure—Bite Versus

**Nonbite:** All bites (penetration of the skin by teeth) constitute a potential exposure, regardless of the bite location. The bites of some animals, such as bats, may go unnoticed because the injury is very minor. Nonbite exposures resulting from encounters with animals include contamination of wounds or mucous membranes with potentially infectious material (e.g., saliva, neural tissue) and exposure to aerosolized rabies virus in caves containing many bats. Although nonbite exposures from terrestrial animals rarely cause rabies, PEP should nonetheless be considered since there are reports of rabies transmission following such incidents.

• **Species of Biting Animal:** The incidence of rabies in dogs and cats varies from one region of the country to another. During the last decade, more cats were found to be rabid than dogs in the United States. Missouri averaged two rabid dogs and one rabid cat annually from 1989–1998. As part of a postexposure assessment, a healthy dog, cat, or ferret may be quarantined for ten days. Rabid bats have been increasingly implicated in the transmission of rabies to humans, possibly through seemingly minor or unrecognized bites. Nationally, wild carnivores such as raccoons, skunks, and foxes are the terrestrial animals

most often found rabid. All bites by such wildlife must be considered as possible exposures. The offspring of wild animals crossbred with domestic dogs and cats are considered wild animals. Small wild and domestic rodents and lagomorphs are very rarely found to be infected with rabies and have not been known to transmit the virus to humans. During 1998, all cases of rabies in rodents and lagomorphs (primarily groundhogs, 63/68 cases) were reported by states in which rabies is enzootic in raccoons.

- **Circumstances of Incident and Vaccination Status of Exposing Animal:** An animal that attacks in an unprovoked fashion is more likely to be rabid than if the incident was provoked. When assessing the variable of unprovoked versus provoked, one must look at the situation from the "perspective" of the animal. That is,

bites inflicted when a person enters the animal's home territory or while feeding or handling the animal are usually considered as provoked. Licensed rabies vaccines are available for dogs, cats, ferrets, cattle, horses, and sheep. A currently vaccinated animal is unlikely to become infected with the rabies virus.

Prevention of rabies in pets is essential in maintaining a barrier between the human population and rabid wild animals. All cats, dogs, and ferrets should be immunized, using a vaccine with a three-year duration when available. Vaccines must be administered by a veterinarian in accordance with the specifications of the product label or package insert. Local governments should maintain programs to remove strays and unwanted animals. Preferably, unvaccinated pets exposed to a rabid animal should be euthanized immedi-

ately. Collectively, strategies such as these have reduced laboratory-confirmed cases in dogs and cats from 6,226 in 1953 to 395 in 1998 in the United States.

#### REFERENCES:

1. Krebs JW, Smith JS, Rupprecht CE, Childs JE. Rabies surveillance in the United States during 1998. *J Am Vet Med Assoc* 1999;215(12):1786-98.
2. CDC. Human rabies prevention—United States, 1999, Recommendations of the advisory committee on immunization practices (ACIP). *MMWR* 1999;48(No. RR-1).
3. Compendium of animal rabies prevention and control, 2000. Madison, WI: National Association of State Public Health Veterinarians, Inc. 1999.
4. Rules of Department of Economic Development, Division 270—Missouri Veterinary Medical Board, Chapter 4—Minimum Standards, March 31, 1996.

## Hepatitis B Vaccine for Newborns

The Missouri Department of Health, the Centers for Disease Control and Prevention (CDC), and the American Academy of Pediatrics (AAP) encourage physicians to administer the first dose of hepatitis B vaccine to newborns, and no later than 2 months of age.

The recommendation is reinstituted because the Food and Drug Administration has approved two preservative-free hepatitis B vaccines:

- Recombivax HB Pediatric (manufactured by Merck Vaccine Division) and
- Engerix B Pediatric (manufactured by Smith-Kline Beecham).

"Resumption of hepatitis B vaccination of newborns is important because confusion about recommendations has resulted in some hospitals failing to immunize newborns delivered to hepatitis B surface antigen positive women. Additionally, data demonstrate that newborns who do not receive hepatitis B vaccine at birth are less likely to complete this series of immunizations," according to Margaret B. Rennels, M.D., F.A.A.P., member of AAP's Committee on Infectious Diseases.

For more information, please call the Section of Vaccine-Preventable and Tuberculosis Disease Elimination, Missouri Department of Health, at (800) 699-2313.

# Section for Environmental Public Health

## 1999 Annual Report

*Brian M. Quinn*

*Section for Environmental Public Health*

The Section for Environmental Public Health (SEPH) is a group of highly diverse programs dedicated to protecting the health and well-being of people in Missouri from hazardous environmental contaminants and conditions. SEPH was created from the blending and strengthening of two related bureaus—Environmental Epidemiology and Community Environmental Health—into one comprehensive environmental public health unit. From food safety to childhood lead poisoning prevention, from risk and health assessment to special public health research studies, SEPH's diversity is its strength and service is its mission.

The following report reflects activities and accomplishments from SEPH's second full year of service under the new organization. It should be noted, however, that this annual report does not represent all of SEPH's various programs. There are some programs that, although they provide crucial health protective services across the state, would not be considered epidemiologically based under a strict definition of the term.

### **SEPH Risk Assessment Programs**

SEPH's two risk assessment programs are heavily involved in assessing the risks that hazardous substances in the environment pose to human health. These programs work closely with other state and federal environmental and health agencies, including the U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (DNR), the federal Agency for Toxic Substances and Disease Registry (ATSDR), the Department of Defense (DOD) and the Department of Energy (DOE). These programs assess human risk through several different kinds of documents that discuss exposure levels,

safe clean-up levels and various aspects related to exposure to substances found at hazardous waste sites statewide. An EPA-funded risk assessment involves a quantitative analysis or review of information about a hazardous waste site. This kind of assessment provides a mathematical "best guess" of what will happen if the site is not cleaned up or if the site is only cleaned up to a specific level of contamination, rather than a safe "walk away" level. A state-funded risk assessment provides more generic clean-up guidelines for sites, based on similar but not identical assumptions/formulae to EPA numbers. The information given in the following two subsections reflects extensive research, cooperation, coordination, document review and inter-agency communication by SEPH staff. The average risk assessment may take as long as two months to complete and submit to EPA.

### **Risk Assessment Program (EPA)**

The following activities were completed during 1999:

- Completed two site-specific human health risk assessments
- Reviewed four site-specific human health risk assessments (from another agency or organization)
- Developed safe residual levels/remediation goals for four sites
- Reviewed 18 site documents for health-related issues
- Attended 21 training courses/conferences
- Attended or gave presentations at five public meetings
- Attended 12 technical site meetings
- Conducted five site visits and/investigations
- Participated on the Governor's Inter-agency Task Force on Methamphetamines
- Participated on the DNR Risk-Based Approach to Groundwater Committee

- Participated on national risk assessment work groups
- Developed cleanup guidelines for illegal methamphetamine lab properties
- Worked on five projects with assessors from other agencies
- Maintained effective communication and working relationships with numerous local, state, and federal agencies and organizations.

For more information, contact the program at (800) 392-7245.

### **Risk Assessment Program (State)**

The following activities were completed during 1999:

- Reassessed 52 abandoned or uncontrolled hazardous waste sites for their risk to public health.
- Assessed four new abandoned or uncontrolled hazardous waste sites for their risk to public health.
- Analyzed 20 sites to determine if private drinking water wells were impacted by nearby contamination.
- Continued assisting DNR by reassessing the health risks at four Department of Defense sites.
- Provided health information to DNR to assist with its Voluntary Cleanup Program. Sixty-seven of these sites are already cleaned up, while 117 more properties are in the process of cleanup.
- Assisted DNR in developing a guidance document for their Brown-field Redevelopment Program.

For more information, contact the program at (800) 392-7245.

### **Public Health Assessment Program (ATSDR)**

The Public Health Assessment Program is part of a state cooperative agreement with ATSDR to conduct health assess-

ments in Missouri communities near hazardous waste sites. In contrast to EPA and state risk assessments, public health assessments provide a qualitative evaluation of exposures to contaminants at a site and related adverse health effects that could have occurred in the past, are presently occurring, or could occur in the future. These health effects are evaluated by estimating exposures based on site visits, interviews with citizens, community and elected leaders, etc., or based on review of documents such as site investigations, risk assessments, site histories and any other available information about a site. Findings from these assessments are reported through public health assessments and health consultations. These documents are designed to address community concerns, as well as to inform and educate the communities about sites, and help them make decisions about how to protect themselves from exposure to site-related contaminants and resulting adverse health effects. These documents also are used by environmental agencies with regulatory power (e.g., EPA) to help make the most health protective decisions when planning clean-up or remediation actions at a site.

All of these program activities represent a tremendous amount of communication, coordination and cooperation with numerous local, state and federal departments and agencies required to complete the work summarized in this report. SEPH has also been involved in numerous other sites and issues which are currently in the early stages of community and governmental activity and development. In 1999, the Public Health Assessment Program:

- Completed three public health assessments.
- Completed 13 health consultations.
- Hosted or attended 13 public availability sessions.
- Visited 15 hazardous waste sites statewide.
- Coordinated one community survey.
- Participated in numerous Community Assistance Group meetings.

- Participated in numerous health education group meetings.
- Provided technical assistance to other agencies.

For more information, contact the program at (800) 392-7245.

### Childhood Lead Poisoning Prevention Program

Childhood lead poisoning is one of the most common preventable environmental health problems in the world today. When lead is introduced into the body through ingestion or inhalation, its adverse toxic health effects on young children's developing nervous, hematopoietic and renal systems can range from acute (coma and seizures) to subtle (learning and behavioral problems or anemia). Young children (age 0–72 months) are at greatest risk due to their hand-to-mouth behaviors. Testing, treatment and prevention of access to lead hazards are key elements to finding and, ultimately, eliminating childhood lead poisoning.

Dust and debris from deteriorating lead-based paint in older housing is considered to be the primary contributor to childhood lead poisoning in the United States today. Paint with the highest lead content was used extensively before 1950. In Missouri, pre-1950 housing comprises nearly 29% of all housing stock. Only 27% of the nation's housing stock was built before 1950. Compared to other states, Missouri has the 24th highest percentage of pre-1950 housing.

Studies also show a strong relationship between elevated blood lead levels and

income. Logically, the increased likelihood for poorer children to inhabit older, deteriorating housing would be a reasonable conjecture. Centers for Disease Control and Prevention (CDC) data substantiate that children in lower income levels are nearly twice as likely to have elevated blood lead levels when compared to all children tested. See Table 1.

However, any remodeling activities that have the potential to disturb lead-based paint and/or its dust, regardless of a family's income, can produce lead hazards and create the potential for lead poisoning. Consequently, caregivers should be aware of these and other factors, and should assess the potential risk for lead poisoning on a case-by-case basis.

Figure 1 on page 6 shows the percentage of pre-1950 housing by county in Missouri with an overlay of the percentage of children less than 6 years of age who are at or below 185 percent of the poverty level. These indicators identify many counties in Missouri that show a high potential risk for childhood lead poisoning. Analyzing smaller geographic boundaries (such as zip codes, census tracts, etc.) can also identify areas with a high potential risk for lead poisoning that Figure 1 may not depict.

While Missouri has its share of older homes containing lead-based paint and poverty, the state also features areas of contaminated soil in vicinities near lead mines and smelters due to its unique role as the largest producer of lead and lead products in the United States. Other  
(continued on page 6)

**Table 1. Percentage of Children Aged 1–5 With Blood Lead Levels  $\geq 10$   $\mu\text{g}/\text{dl}$  by Income Level, United States, 1991–1994**

<u>Income Level</u>	<u>Percent of Children Aged 1–5 With Blood Lead Levels <math>\geq 10</math> <math>\mu\text{g}/\text{dl}</math></u>
Low	8.0%
Middle	1.9%
High	1.0%
All children	4.4%

Source: Centers for Disease Control and Prevention. Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials. November 1997.

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related risk factors include parents employed at lead mines or smelters and/or other lead occupations and hobbies.

There are also other sources of lead hazards such as (the following list is not all-inclusive):

- Improperly glazed or fired pottery and ceramic-ware that when used for food or beverage vessels can leach lead into food
- Mini-blinds
- Lead crystal
- Stained-glass making, artist's paints, crayons (imported), inorganic pigments
- Lead solder (used for welding, e.g., electronics, imported food cans/containers, etc.)
- Lead-cast figurines or jewelry
- Imported candy (wrappers)
- Ammunition, batteries, fishing sinkers
- Traditional medicines and cosmetics including:
  - ASIAN: Chuifon tokuwan, pay-loo-ah, ghasard, bali goli, kandu
  - MEXICAN: azarcon and greta (also known as liga, Maria Louisa, alarcon, coral, and rueda)
  - MIDDLE EASTERN: alkohl, kohl, surma, saoot, cebagin

During 1999 in Missouri, 46,715 children less than 6 years of age were reported to have been screened for lead poisoning. This figure represents 10 percent of the estimated population of children in this age group, making 1999 the highest year of lead screening activity since the Missouri Department of Health began lead surveillance in 1995. Screening during 1999 increased by 7 percent compared to 1998 (43,591). Figure 2 shows the ranges of lead screening activity by county during 1999.

Of the children tested for lead poisoning during 1999, 5,092 (10.9%) were identified with blood lead elevations  $\geq 10 \mu\text{g/dl}$  (the CDC's level of concern). In comparison to 1998 figures (5,342 elevated/43,591 screened = 12.3%), this represents a 1.4

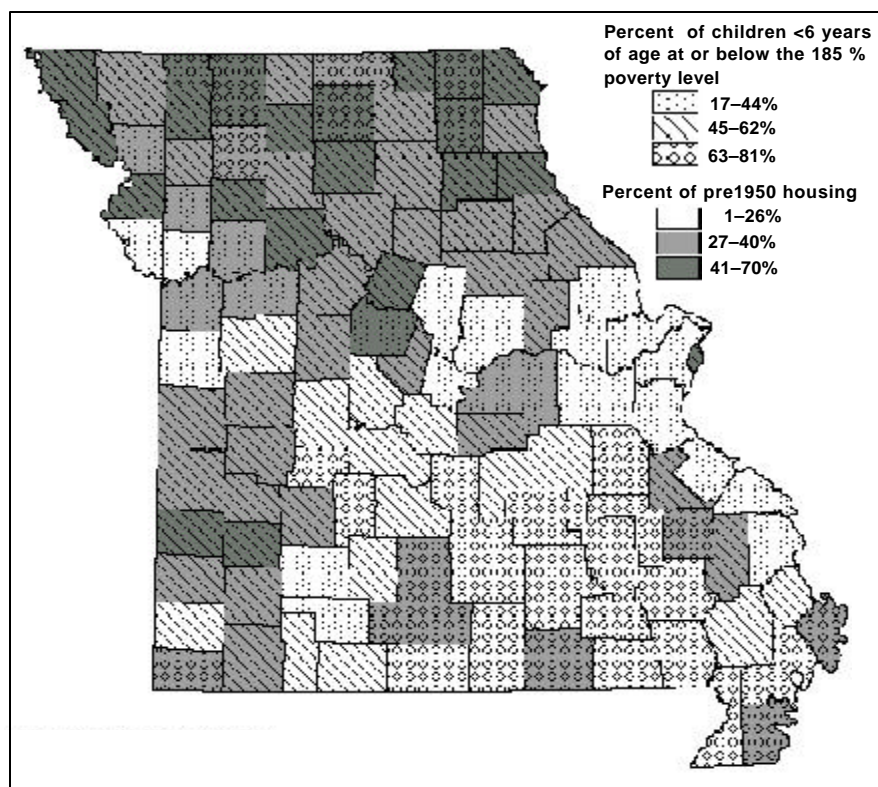


Figure 1. Percentage of pre-1950 housing and percentage of children <6 years of age at or below the 185 percent poverty level by county, Missouri, 1990.

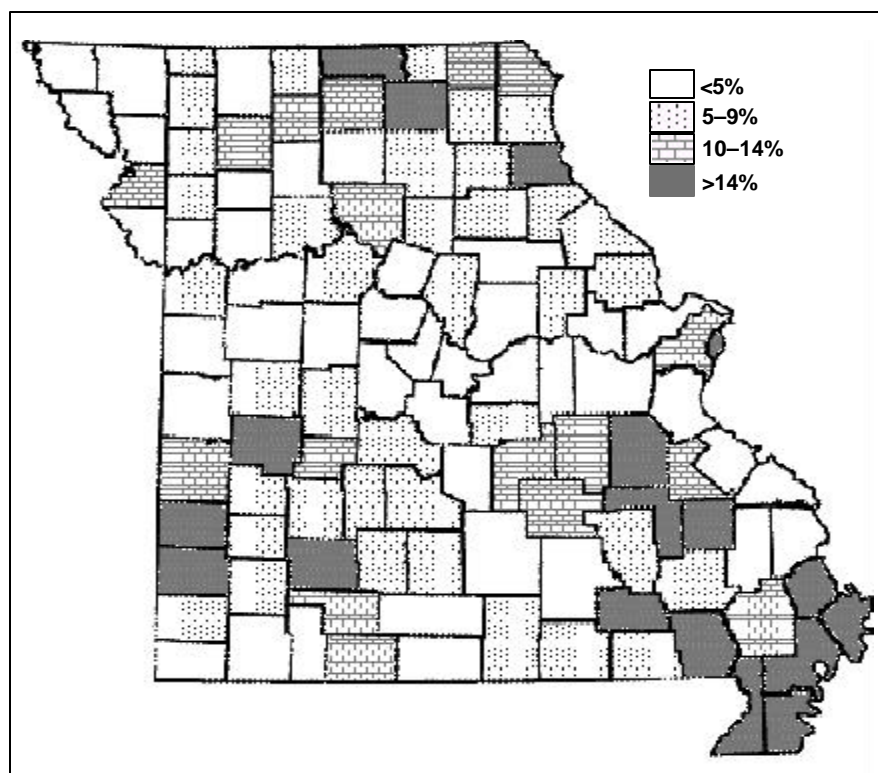


Figure 2. Percentage of children <6 years of age tested for lead poisoning by county, Missouri Childhood Lead Poisoning Prevention Program, 1999.

percent decline in the proportion of children testing at or above the level of concern for lead poisoning. Interestingly, a 1.4 percent decline was also realized during 1998 compared to 1997. However, in comparing the current 10.9 percent Missouri rate to the national rate of 4.4 percent (Table 1), Missouri still has a long way to go before childhood lead poisoning is eradicated. Actual numbers of children tested and elevated by individual county are available by contacting the Missouri Department of Health Childhood Lead Poisoning Prevention Program at (800) 575-9267).

A major function of the Missouri Childhood Lead Poisoning Prevention Program is to increase the number of reported blood lead screenings in order to determine the extent of lead poisoning and its location. Efforts necessary to accomplish this include educating Medicaid Managed Care plans and physicians regarding required blood lead screening during 12- and 24-month well-child visits, encouraging private laboratory reporting, and increasing general public awareness through various media sources. Future efforts will continue to be focused in areas identified to have the greatest potential risk to children based on housing, poverty, screening numbers and lead occupations.

Another primary role of the Missouri Childhood Lead Poisoning Prevention Program is to identify and prevent/eliminate access to environmental lead hazards for children with blood lead levels  $\geq 20\mu\text{g}/\text{dl}$ . Home environmental assessments are generally conducted by a public health nurse and a sanitarian trained in lead hazard assessment. They educate the family about specific personal hygiene, such as frequent and thorough handwashing of the child, washing toys, wet mopping to remove lead dust from floors and surfaces where small children play, and good nutrition through a diet high in iron and calcium to prevent bodily absorption of lead. During 1999, 1,097 environmental assessments to detect sources of lead hazards were conducted.

Throughout the state, other lead program efforts include increasing community awareness and involvement in the efforts to eliminate and prevent childhood lead poisoning. Information concerning the level of risk for childhood lead poisoning for local needs assessments play an integral role in this process. For further information, please contact your local public health agency, or call the Childhood Lead Poisoning Prevention Program at (800) 575-9267.

### **Environmental and Occupational Diseases and Conditions Passive Surveillance System**

The section maintains this passive surveillance system to document occupational diseases and environmental health conditions which are required to be reported to the Department of Health by 19 CSR 20-20.020 and 19 CSR 20-20.080. Each year, the surveillance system receives reports on cases of environmental and occupational diseases and conditions that are entered into a database for evaluation and analysis. Cases of lead poisoning in children under 6 years of age are not included in the system because they are tracked by the state's Childhood Lead Poisoning Prevention Program described earlier in this report.

The majority of conditions reported within a given year typically are lead poisoning in adults and lead poisoning in 6 to 17-year-olds. However, final reports for lead poisoning in these two age groups were unavailable for this annual report. Also reported to the surveillance system are acute chemical poisoning (12 cases in 1999) and carbon monoxide poisoning (41 cases in 1999).

For more information, contact the program at (800) 392-7245.

### **Radiological Health Program**

SEPH's Radiological Health Program is responsible for overseeing and regulating sources of ionizing radiation in non-medical settings. These sources are used in many ways, for example in nuclear pharmacies and industrial radiography.

The program is also involved in emergency response and environmental radiation activities. Program staff also gather sampling results from radon detectors distributed statewide through county and city public health agencies for testing in their areas, and provide radon information through seminars, displays and public awareness presentations. The Radon Hotline provides Missouri residents easy access to radon information. In 1999, the Radiological Health Program:

- Continued to register and reregister ionizing radiation sources used in non-medical settings:
  - 93 industrial radioactive material users
  - 118 X-ray users
- Performed periodic radiation safety surveys of industrial X-ray and radioactive material registrants.
- Participated in extensive training activities in preparation for emergency events at the Callaway and Cooper nuclear power plants. Training included drills, dress rehearsals and exercises. This year's Callaway exercise was federally evaluated and the section successfully demonstrated the capability to protect public health and safety in the event of a nuclear plant emergency event.
- Responded to four requests for assistance by scrap metal recyclers and landfill operators to locate and characterize radioactive sources.
- Continued to maintain and cultivate close working relationships with local, state and federal agencies and organizations including the Missouri Department of Natural Resources, Environmental Protection Agency, American Lung Association, Missouri Association of School Administrators and the Missouri Public Health Association. These relationships provided opportunities for information exchange, data gathering, coalition building, community outreach and funding.
- Provided radon detectors to county and city public health agencies for

*(continued on page 8)*

## VIDEOCONFERENCE in 2000

### Surveillance of Vaccine-Preventable Diseases

**CORRECTED DATE** December 8, 2000  
**11:00 a.m.–2:30 p.m. CST**

This program will provide guidelines for vaccine-preventable disease surveillance, case investigation and outbreak control.

For more information about the course and site locations, contact the immunization representative located in your district health office or the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313.

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testing in their areas. These agencies distributed more than 800 detectors in their areas.

- Responded to approximately 700 phone calls through the Radon Hotline.

For more information, contact the Radon Hotline at (800) 669-7236.

### Special Studies

One of SEPH's most important functions is to coordinate and conduct special epidemiological studies that are designed to determine whether and to what extent Missourians are exposed to hazards in the environment. These studies require a tremendous amount of time, effort, coordination, planning, financial resources and personnel. A study can take up to two years or longer to complete from inception to the published final report. The following summarizes special study efforts in 1999:

#### Missouri Statewide Food Service Survey

The section conducted this survey during September, October and November 1998. Groundwork for the statewide survey was laid by a pilot survey conducted in January 1998 in the department's northeastern health district. The pilot, which included 100 randomly selected food service establishments, was designed to determine if the survey questionnaire and inspection protocol were viable, whether personnel conducting the survey needed additional

training, whether the survey would generate useful baseline information, and to identify public health needs in Missouri's food service industry. The statewide survey involved 1,200 food service establishments across the state. Information was collected by questionnaire on the education and training of food service employees, needs for educational/training materials in languages other than English, hepatitis A vaccination levels for food service employees, length of time employed in food service, number of employees, number of meals/customers served, reasons for taking sick days, and the presence of policies and procedures. A regular inspection was conducted at the same time. A final report of survey results was distributed on May 1, 2000. A summary of the survey results was published in the March-April 2000 issue of this newsletter and may be obtained by contacting the Food Program at (800) 392-7245.

#### Follow-up Missouri Statewide Food Service Survey

The section began a smaller statewide food survey in the fall of 1999. Information was collected by questionnaire on education and training of food service employees, needs for educational/training materials in languages other than English, hepatitis A vaccination levels for food services employees, length of time employed in food service, number of employees, number of meals/customers served, reasons for taking sick days and the presence of policies and

procedures. A regular inspection was conducted at the same time. The survey will be completed in 2000. As part of the Department of Health strategic plan, the section will conduct mini-surveys each year for five years. At the end of the five-year period, another large-scale survey will be conducted.

#### Follow-up Childhood Lead Exposure Study—Jasper County

The section began the groundwork for a follow-up study, funded by ATSDR, in children between the ages of 6 months and 6 years living in the Jasper County designated Superfund area. The study will be conducted in 2000. Results will be compared to those obtained during a lead and cadmium exposure study conducted in Jasper County during 1991. This study is being conducted to determine whether the health education activities and remediation efforts conducted in Jasper County have been effective in reducing blood lead levels in children under 6 years of age.

For more information about these special studies, contact the section at (800) 392-7245.

## Disease Reporting

Cases of reportable diseases and conditions should be reported promptly to your local health department, or to the Missouri Department of Health at

**(800) 392-0272**

(during working hours).

The emergency number is

**(573) 751-4674**

(for after hours, weekends or holidays).

# Missouri Rehabilitation Center Helps Managed Care Providers Control Infectious Diseases

*Carol Wilhite*

*Missouri Rehabilitation Center*

As medical technology improves and we become 'smarter' in our treatment of infectious diseases, we often find diseases getting 'smarter' at resisting treatment. Such is the case with tuberculosis (TB). Once almost eradicated, TB increased dramatically in the early 90s before being brought under control again. However, TB continues to be very problematic in certain pockets of the population in the United States. Worldwide, TB is the most common bacterial disease and one-third of the world's population is infected with this organism. Early diagnosis and modern drug treatments make it possible for most TB patients to be treated right in their home communities at their local health-care clinics.

In industrialized nations, TB has been declining, but is linked more than ever before to homelessness, inner city poverty and drug abuse. TB poses a major health concern for intravenous drug users, those with HIV infection or AIDS, foreign-born individuals from countries with a high prevalence of disease, the elderly, inmates in correctional facilities, the homeless and minorities. Left untreated, TB can be fatal. Left undiagnosed, TB can become a raging epidemic as it was in the early 1900s.

An increasing number of new patients do not respond well to traditional treatment and, therefore, require admittance to a program specializing in advanced TB treatment. Most states do not have the type of inpatient programs necessary to treat drug-resistant TB. Such treatment environments cannot be created overnight. Isolation rooms with negative airflow filtration systems are expensive to establish, and with antiquated buildings, sometimes impossible to add to existing facilities.

States in the midwest are solving their treatment dilemmas by contracting with the Missouri Rehabilitation Center (MRC). Founded in 1907 as a state TB hospital, MRC has greatly expanded over the years to include a broad range of pulmonary treatments and rehabilitation programs. The original mission, however, has not changed. More than 90 years of experience enables MRC to provide specialized treatment, acute care nursing, nutritional support, therapy and education for TB patients in Missouri and surrounding states.

The Missouri Department of Health's TB laboratory is housed at MRC and plays a crucial role in the center's continued leadership in this field. The laboratory has been the site of multiple research projects for in-state and out-of-state agencies.

The Missouri Rehabilitation Center is a member of the University of Missouri Health Sciences Center. Physicians not only care for patients; they are also educators and researchers. They are up-to-date on the latest technology and medical treatments, which ultimately leads to better patient care.

TB treatment facilities are state-of-the-art and include an isolation wing with private and semi-private rooms as well as a non-isolation wing. Patients at MRC receive services from a whole team of rehabilitation professionals. A full-service radiology department, a respiratory therapy department and a full spectrum of other rehabilitation services enable MRC to successfully treat TB patients with multiple medical problems.

MRC accepts Medicare, Medicaid and private insurance. A sliding scale means test may be applied to any balance not covered by Medicare or insurance. After financial information is provided, patients are charged according to their ability to pay as determined by the scale. MRC is a Diagnostic Regulatory Guideline (DRG)-exempt facility. No one will be denied admission because of inability to pay. Contracts may include transportation costs, housing for family members, and more. No two cases are identical; therefore, each contract is individually prepared.

Treatment plans, compliance reports, progress reports and any documentation or communication desired by the referral source is provided promptly by medical staff. Health-care professionals today are required to provide high quality healthcare at rock bottom prices. After exploring the options, many providers are turning to MRC for that care.

MRC can treat even the most difficult TB cases. Persons who are court-ordered to receive TB treatment are usually successfully rehabilitated at MRC. When ready for discharge, staff members work closely with the state's TB Control Program to develop appropriate discharge plans for those patients.

For more information, please contact:  
Missouri Rehabilitation Center  
600 N. Main St.  
Mt. Vernon, MO 65712  
Ph: (417) 466-3711  
<http://www.muhealth.org/~rehab>  
Email: [askmrc@health.missouri.edu](mailto:askmrc@health.missouri.edu)

## Erratum:

We apologize for omitting the names of staff of the St. Louis City Department of Health who contributed to the article entitled Primary Multidrug-Resistant Tuberculosis in St. Louis City, 1997-99 published in the January-February 2000 issue of the *Missouri Epidemiologist*. Those St. Louis City staff who contributed to this article included Don Weiss, M.D., M.P.H. and Rose Ann Rook, R.N. The authors of the article were Dr. Weiss, Lynelle Phillips and Rose Ann Rook.

# State Public Health Laboratory - 1999 Annual Report

## Metabolic Disease Screening

<b>Infants screened</b>	<b>77,625</b>
Presumptive positives:	
PKU	5
Hypothyroidism	32
Galactosemia	20
Sickle Cell	22
Other hemoglobinopathies	1,383

## Serology/Virology

<b>HIV Serology</b>	<b>73,264</b>
HIV antibody positive	558

<b>Syphilis Serology</b>	<b>28,833</b>
Sero-confirmed reactive	706

<b>Hepatitis A Serology</b>	<b>647</b>
Positive	71

<b>Hepatitis B Serology</b>	<b>7,124</b>
Positive	94

<b>Measles, Mumps and Rubella (Diagnostic Serologies)</b>	<b>6,973</b>
Measles (IgM positive)	2
Mumps (significant rise in titer)	1
Rubella (IgM positive)	3
Prenatal rubella screens	6,910
Nonreactive patients	860

<b>Viral Isolation</b>	<b>1,934</b>
Influenza isolates	277
Enterovirus isolates	6
Herpes isolates	446

<b>Rabies</b>	<b>2,735</b>
Positive specimens	34

## Microbiology

<b>Enterics</b>	<b>2,242</b>
<i>Salmonella</i>	654
<i>Shigella</i>	369
<i>Campylobacter jejuni</i>	13
<i>E. coli</i> O157:H7	73

<b>Parasitology</b>	<b>4,062</b>
Ova/parasites found	1,327

<b>Reference Bacteriology</b>	<b>1,606</b>
<i>Francisella tularensis</i>	3
<i>Haemophilus influenzae</i>	14
<i>Neisseria meningitidis</i>	47
<i>Bordetella pertussis</i>	74

<b>DNA Probe for Chlamydia/Gonorrhea</b>	<b>66,066</b>
<i>N. gonorrhoeae</i>	1,314
<i>Chlamydia trachomatis</i>	3,266

<b>Tuberculosis</b>	<b>9,949</b>
Positive Cultures	732

## Environmental Testing

<b>Chemistry</b>	<b>15,803</b>
Blood lead samples	14,486
Total analyses	23,569
Blood lead $\geq 20\mu\text{g/dL}$	197
Environmental lead samples	254

<b>Bacteriology—Water</b>	
<b>Private Samples</b>	<b>12,443</b>
Coliform positive	4,395
<b>Public Supplies</b>	<b>62,271</b>
Coliform positive	2,797
<i>E. coli</i> /fecal coliform positive	214

<b>Swimming Pools</b>	<b>1,529</b>
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<b>Food/Dairy/Beverage</b>	<b>3,805</b>
Excessive bacteria, coliform, yeast and mold	146

# Exposure to Blood

## What Health-Care Workers Need to Know

Reprint of a publication from the Centers for Disease Control and Prevention's Hospital Infections Program and Division of Viral and Rickettsial Diseases. This publication is available in PDF format on the World Wide Web at [http://www.cdc.gov/ncidod/hip/Blood/Exp\\_to\\_Blood.pdf](http://www.cdc.gov/ncidod/hip/Blood/Exp_to_Blood.pdf). To purchase copies of the document, contact the Public Health Foundation at (877) 252-1200 (toll free) or at <http://bookstore.phf.org/>

### OCCUPATIONAL EXPOSURES TO BLOOD

#### Introduction

Health-care workers are at risk for occupational exposure to bloodborne pathogens, including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). Exposures occur through needlesticks or cuts from other sharp instruments contaminated with an infected patient's blood or through contact of the eye, nose, mouth, or skin with a patient's blood. Important factors that may determine the overall risk for occupational transmission of a bloodborne pathogen include the number of infected individuals in the patient population, the chance of becoming infected after a single blood contact from an infected patient, and the type and number of blood contacts.

Most exposures do not result in infection. Following a specific exposure, the risk of infection may vary with factors such as these:

- The pathogen involved
- The type of exposure
- The amount of blood involved in the exposure
- The amount of virus in the patient's blood at the time of exposure

Your employer should have in place a system for reporting exposures in order to quickly evaluate the risk of infection, inform you about treatments available to help prevent infection, monitor you for side effects of treatments, and to determine if infection occurs. This may involve testing your blood and that of the source patient and offering appropriate postexposure treatment.

#### How can occupational exposures be prevented?

Many needlesticks and other cuts can be prevented by using safer techniques (e.g., not recapping needles by hand), disposing of used needles in appropriate sharps disposal containers, and using medical devices with safety features designed to prevent injuries. Many exposures to the eyes, nose, mouth, or skin can be prevented by using appropriate barriers (e.g., gloves, eye and face protection, gowns) when contact with blood is expected.

### IF AN EXPOSURE OCCURS

#### What should I do if I am exposed to the blood of a patient?

1. Immediately following an exposure to blood:
  - Wash needlesticks and cuts with soap and water
  - Flush splashes to the nose, mouth, or skin with water
  - Irrigate eyes with clean water, saline, or sterile irrigants

No scientific evidence shows that using antiseptics or squeezing the wound will reduce the risk of transmission of a bloodborne pathogen. Using a caustic agent such as bleach is not recommended.

2. Following any blood exposure you should:

**Report the exposure** to the department (e.g., occupational health, infection control) responsible for managing exposures. Prompt reporting is essential because, in some cases, postexposure treatment may be recommended and it should be started as soon as possible.

Discuss the possible risks of acquiring HBV, HCV, and HIV and the need for postexposure treatment with the provider managing your exposure. You should have already received hepatitis B vaccine, which is extremely safe and effective in preventing HBV infection.

## **RISK OF INFECTION AFTER EXPOSURE**

### **What is the risk of infection after an occupational exposure?**

#### **HBV**

Health-care workers who have received hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection. For an unvaccinated person, the risk from a single needlestick or a cut exposure to HBV-infected blood ranges from 6–30% and depends on the hepatitis B e antigen (HBeAg) status of the source individual. Individuals who are both hepatitis B surface antigen (HBsAg) positive and HBeAg positive have more virus in their blood and are more likely to transmit HBV.

#### **HCV**

Based on limited studies, the risk for infection after a needlestick or cut exposure to HCV-infected blood is approximately 1.8%. The risk following a blood splash is unknown, but is believed to be very small; however, HCV infection from such an exposure has been reported.

#### **HIV**

- The average risk of HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3% (i.e., three-tenths of one percent, or about 1 in 300). Stated another way, 99.7% of needlestick/cut exposures do not lead to infection.
- The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be, on average, 0.1% (1 in 1,000).
- The risk after exposure of the skin to HIV-infected blood is estimated to be less than 0.1%. A small amount of blood on intact skin probably poses no risk at all. There have been no documented cases of HIV transmission due to an exposure involving a small amount of blood on intact skin (a few drops of blood on skin for a short period of time). The risk may be higher if the skin is damaged (for example, by a recent cut) or if the contact involves a large area of skin or is prolonged (for example, being covered in blood for hours).

### **How many health-care workers have been infected with bloodborne pathogens?**

#### **HBV**

The annual number of occupational infections has decreased sharply since hepatitis B vaccine became available in 1982 (i.e., there has been a 90% decrease in the number of estimated cases from 1985 to 1996). Nonetheless, approximately 800 health-care workers become infected with HBV each year following an occupational exposure.

## **HCV**

There are no exact estimates on the number of health-care workers occupationally infected with HCV. However, studies have shown that 1% of hospital health-care workers have evidence of HCV infection (about 1.8% of the U.S. population has evidence of infection). The number of these workers who may have been infected through an occupational exposure is unknown.

## **HIV**

As of December 1998, CDC had received reports of 54 documented cases and 134 possible cases of occupationally acquired HIV infection among health-care workers in the United States since reporting began in 1985.

## **TREATMENT FOR THE EXPOSURE**

### **Is vaccine or treatment available to prevent infections with bloodborne pathogens?**

#### **HBV**

As mentioned above, hepatitis B vaccine has been available since 1982 to prevent HBV infection. All health-care workers who have a reasonable chance of exposure to blood or body fluids should receive hepatitis B vaccine. Vaccination ideally should occur during the health-care worker's training period. Workers should be tested 1–2 months after the vaccine series to make sure that vaccination has provided immunity to HBV infection.

Hepatitis B immune globulin (HBIG) is effective in preventing HBV infection after an exposure. The decision to begin treatment is based on several factors, such as:

- Whether the source individual is positive for hepatitis B surface antigen.
- Whether you have been vaccinated.
- Whether the vaccine provided you immunity.

#### **HCV**

There is no vaccine against hepatitis C, and no treatment after an exposure that will prevent infection. Immune globulin is not recommended. For these reasons, following recommended infection control practices is imperative.

#### **HIV**

There is no vaccine against HIV. However, results from a small number of studies suggest that the use of zidovudine after certain occupational exposures may reduce the chance of HIV transmission.

Postexposure treatment is not recommended for all occupational exposures to HIV because most exposures do not lead to HIV infection and because the drugs used to prevent infection may have serious side effects. Taking these drugs for exposures that pose a lower risk for infection may not be worth the risk of the side effects. You should discuss the risks and side effects with a health-care provider before starting postexposure treatment for HIV.

### **What about exposures to blood from an individual whose infection status is unknown?**

#### **HBV-HCV-HIV**

If the source individual cannot be identified or tested, decisions regarding follow-up should be based on the exposure risk and whether the source is likely to be a person who is infected with a bloodborne pathogen. Follow-up testing should be available to all workers who are concerned about possible infection through occupational exposure.

## **What specific drugs are recommended for postexposure treatment?**

### **HBV**

If you have not been vaccinated, then hepatitis B vaccination is recommended for any exposure regardless of the source person's hepatitis B status. HBIG and/or hepatitis B vaccine may be recommended depending on your immunity to hepatitis B and the source person's infection status.

### **HCV**

Currently there is no recommended postexposure treatment that will prevent HCV infection.

### **HIV**

The Public Health Service recommends a 4-week course of two drugs (zidovudine and lamivudine) for most HIV exposures, or zidovudine and lamivudine plus a protease inhibitor (indinavir or nelfinavir) for exposures that may pose a greater risk for transmitting HIV (such as those involving a larger volume of blood with a larger amount of HIV or a concern about drug-resistant HIV). Differences in side effects associated with the use of these two drugs may influence which drug is selected in a specific situation.

These recommendations are intended to provide guidance to clinicians and may be modified on a case-by-case basis. Determining which drugs and how many drugs to use or when to change a treatment regimen is largely a matter of judgement. Whenever possible, consulting an expert with experience in the use of antiviral drugs is advised, especially if a recommended drug is not available, if the source patient's virus is likely to be resistant to one or more recommended drugs, or if the drugs are poorly tolerated.

## **How soon after exposure to a bloodborne pathogen should treatment start?**

### **HBV**

Postexposure treatment should begin as soon as possible after exposure, preferably within 24 hours, and no later than 7 days.

### **HIV**

Treatment should be started promptly, preferably within hours as opposed to days, after the exposure. Although animal studies suggest that treatment is not effective when started more than 24–36 hours after exposure, it is not known if this time frame is the same for humans. Starting treatment after a longer period (e.g., 1–2 weeks) may be considered for the highest risk exposures; even if HIV infection is not prevented, early treatment of initial HIV infection may lessen the severity of symptoms and delay the onset of AIDS.

## **Has the FDA approved these drugs to prevent blood-borne pathogen infection following an occupational exposure?**

### **HBV**

Yes. Both hepatitis B vaccine and HBIG are approved for this use.

### **HIV**

No. The FDA has approved these drugs for the treatment of existing HIV infection, but not as a treatment to prevent infection. However, physicians may prescribe any approved drug when, in their professional judgment, the use of the drug is warranted.

## **What is known about the safety and side effects of these drugs?**

### **HBV**

Hepatitis B vaccine is very safe. There is no information that the vaccine causes any chronic illnesses. Most illnesses reported after an HBV vaccination are often related to other causes and not the vaccine. However, you should report any unusual reaction after a hepatitis B vaccination to your health-care provider.

## **HIV**

All of the antiviral drugs for HIV have been associated with side effects. The most common side effects include upset stomach (nausea, vomiting, diarrhea), tiredness, or headache. The few serious side effects that have been reported in health-care workers using combination postexposure treatment have included kidney stones, hepatitis, and suppressed blood cell production. Protease inhibitors (indinavir and nefinavir) may interact with other medicines and cause serious side effects and should not be used in combination with certain other drugs, such as prescription antihistamines. It is important to tell the health-care provider managing your exposure about any medications you are currently taking, if you need to take antiviral drugs for an HIV exposure.

## **Can pregnant health-care workers take the drugs recommended for postexposure treatment?**

### **HBV**

Yes. Women who are pregnant or breast feeding can be vaccinated against HBV infection and/or get HBIG. Pregnant women who are exposed to blood should be vaccinated against HBV infection, because infection during pregnancy can cause severe illness in the mother and a chronic infection in the newborn. The vaccine does not harm the fetus.

### **HIV**

Pregnancy should not rule out the use of postexposure treatment when it is warranted. If you are pregnant you should understand what is known and not known regarding the potential benefits and risks associated with the use of antiviral drugs in order to make an informed decision about treatment.

## **FOLLOW-UP AFTER AN EXPOSURE**

### **What follow-up should be done after an exposure?**

#### **HBV**

Because postexposure treatment is highly effective in preventing HBV infection, CDC does not recommend routine follow-up after treatment. However, any symptoms suggesting hepatitis (e.g., yellow eyes or skin, loss of appetite, nausea, vomiting, fever, stomach or joint pain, extreme tiredness) should be reported to your health-care provider.

#### **HCV**

You should have an antibody test for hepatitis C virus and a liver enzyme test (alanine aminotransferase activity) as soon as possible after the exposure (baseline) and at 4-6 months after the exposure. Some clinicians may also recommend another test (HCV RNA) to detect HCV infection 4-6 weeks after the exposure. Report any symptoms suggesting hepatitis (mentioned above) to your health-care provider.

#### **HIV**

You should be tested for HIV antibody as soon as possible after exposure (baseline) and periodically for at least 6 months after the exposure (e.g., at 6 weeks, 12 weeks, and 6 months).

If you take antiviral drugs for postexposure treatment, you should be checked for drug toxicity by having a complete blood count and kidney and liver function tests just before starting treatment and 2 weeks after starting treatment.

You should report any sudden or severe flu-like illness that occurs during the follow-up period, especially if it involves fever, rash, muscle aches, tiredness, malaise, or swollen glands. Any of these may suggest HIV infection, drug reaction, or other medical conditions.

You should contact the health-care provider managing your exposure if you have any questions or problems during the follow-up period.

### **What precautions should be taken during the follow-up period?**

#### **HBV**

If you are exposed to HBV and receive postexposure treatment, it is unlikely that you will become infected and pass the infection on to others. No precautions are recommended.

#### **HCV**

Because the risk of becoming infected and passing the infection on to others after an exposure to HCV is low, no precautions are recommended.

#### **HIV**

During the follow-up period, especially the first 6–12 weeks when most infected persons are expected to show signs of infection, you should follow recommendations for preventing transmission of HIV. These include not donating blood, semen, or organs and not having sexual intercourse. If you choose to have sexual intercourse, using a condom consistently and correctly may reduce the risk of HIV transmission. In addition, women should consider not breast-feeding infants during the follow-up period to prevent exposing their infants to HIV in breast milk.

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## **Selected Web Sites Providing Additional Information on Prevention of Infections in Health-Care Settings**

CDC. **Hospital Infections Program**

<http://www.cdc.gov/ncidod/hip/>

CDC. **Hospital Infections Program: Bloodborne Pathogens** (Includes information and guidelines on HIV, hepatitis B, and hepatitis C.)

<http://www.cdc.gov/ncidod/hip/BLOOD/blood.htm>

CDC. **Hospital Infections Program: Guidelines & Recommendations** (Includes guidelines for prevention of healthcare-associated infections)

<http://www.cdc.gov/ncidod/hip/Guide/guide.htm>

HIV/AIDS Treatment Information Service (ATIS). **Treatment Guidelines: Health-Care Worker Exposure Guidelines**

<http://hivatis.org/trtgdlns.html>

American Academy of Pediatrics (AAP). **Policy Statement: Infection Control in Physicians' Offices (RE9962)**, June 2000

<http://www.aap.org/policy/re9962.html>

Missouri Department of Health. **Infection Control Guidelines for Long Term Care Facilities**

<http://www.health.state.mo.us/Publications/ICtableconts.html>

**Association for Professionals in Infection Control and Epidemiology (APIC)**

<http://www.apic.org/>

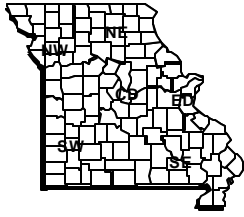
**Occupational Safety and Health Administration (OSHA)**

<http://www.osha.gov/>

**PEPLine (National Clinician's Post-Exposure Prophylaxis Hotline) 1-888-HIV-4911 (448-4911)**


(24-hour, seven days a week, free emergency hotline for clinicians who need advice on treating patients who have suffered occupational exposures to blood; staffed by University of California, San Francisco health care providers at San Francisco General Hospital)

<http://epi-center.ucsf.edu/PEP/pepline.html>



Missouri Department of Health  
Division of Environmental Health and Communicable Disease Prevention  
**QUARTERLY DISEASE REPORT**

Reporting Period\*  
**October - December 1999**

	Districts											3 Month State Totals		Cumulative			
	CD	** ED	NE	** NW	SE	** SW	*** OTHER	Kansas City	St. Louis City	St. Louis Co.	Spfld. Greene Co.	1999	1998	For 1999	For 1998	5 YR MEDIAN	
<b>Vaccine Preventable</b>																	
Influenza	151	189	47	20	101	44	0	3	243	506	87	1391	15	2337	1089	283	
Measles	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	10	
Pertussis	11	0	2	1	2	1	0	3	1	0	2	23	21	75	59	63	
<b>Viral Hepatitis</b>																	
A	12	32	1	43	23	14	1	23	62	113	9	333	99	712	637	1151	
B	4	3	1	10	1	10	0	2	27	22	2	82	66	224	252	360	
C	1	0	0	1	0	1	2	0	1	1	1	8	4	35	14	n/a	
Non-A Non-B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a	
Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a	
<b>Meningitis</b>																	
Meningococcal Disease	1	1	0	1	0	3	0	0	0	3	0	9	7	45	25	43	
Meningococcal Other	0	1	0	2	0	1	0	1	0	4	1	10	7	49	55	41	
<b>Enteric Infections</b>																	
Campylobacter	16	11	9	20	16	13	0	10	1	18	4	118	136	569	535	574	
E. Coli O157:H7	3	1	0	2	1	1	0	0	0	3	0	11	18	47	55	55	
Salmonella	22	17	1	29	31	22	3	9	6	27	11	178	140	764	632	577	
Shigella	6	17	12	3	0	18	1	4	6	38	8	113	123	720	221	387	
<b>Parasitic Infections</b>																	
Cryptosporidiosis	1	1	0	0	2	1	0	0	1	1	1	8	9	26	29	33	
Giardiasis	32	27	21	21	8	10	0	9	31	36	3	198	228	807	790	777	
<b>Respiratory Diseases</b>																	
Legionellosis	0	1	0	1	0	0	0	0	1	1	0	4	4	22	18	19	
<b>Sexually Transmitted</b>																	
AIDS	7	8	1	10	4	5	6	30	43	27	1	142	144	461	489	155	
HIV Infection	7	8	1	6	4	3	9	37	24	10	2	111	107	421	489	n/a	
Chlamydia	333	89	79	178	238	358		583	866	802	159	3526	3272	13355	12670	12257	
Gonorrhea	116	21	29	49	124	54		494	794	518	34	2199	2780	8187	9463	8415	
P & S syphilis	2	1	0	0	4	0		0	15	2	0	24	28	99	109	118	
<b>Tuberculosis</b>																	
TB Disease	3	2	0	5	7	11	3	18	17	4	8	78	63	208	184	n/a	
TB Infections	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
<b>Zoonotic</b>																	
Ehrlichiosis	4	0	0	0	21	0	0	0	2	4	0	31	2	56	12	12	
Lyme Disease	2	0	0	0	6	4	0	0	0	1	0	13	1	72	12	52	
Rabies (Animal)	0	0	0	2	2	0	0	0	2	0	0	6	11	31	42	30	
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	1	0	1	0	2	1	16	5	22	
Tularemia	0	1	1	1	1	0	0	0	0	0	0	4	1	19	12	18	
<b>Outbreaks</b>																	
Foodborne - 1	<b>Low Frequency Vaccine Preventable Diseases</b>							<b>Low Frequency Diseases</b>									
Waterborne - 1	Diphtheria							Anthrax							Plague		
Hepatitis A - 3	Hib Meningitis - 8							Botulism							Psittacosis		
Salmonella -1	Hib other invasive							Brucellosis							Rabies (human)		
Influenza or Flu-Like - 5	Polio							Chancroid							Reye syndrome		
Scabies	Rubella -							Cholera							Rheumatic fever, acute		
Group A Strep - 1	Tetanus							Encephalitis							Streptococcal Disease, Invasive, Grp A		
Other - 6								Granuloma Inguinale							Streptococcus pneumoniae,		
								Kawasaki Disease							Drug Resistant Invasive Disease		
								Leptospirosis							Toxic Shock Syndrome		
								Listeria - 4							Trichinosis		
								Lymphogranuloma Venereum							Typhoid Fever		

\*Reporting Period Beginning October 3, 1999 and Ending January 1, 2000.

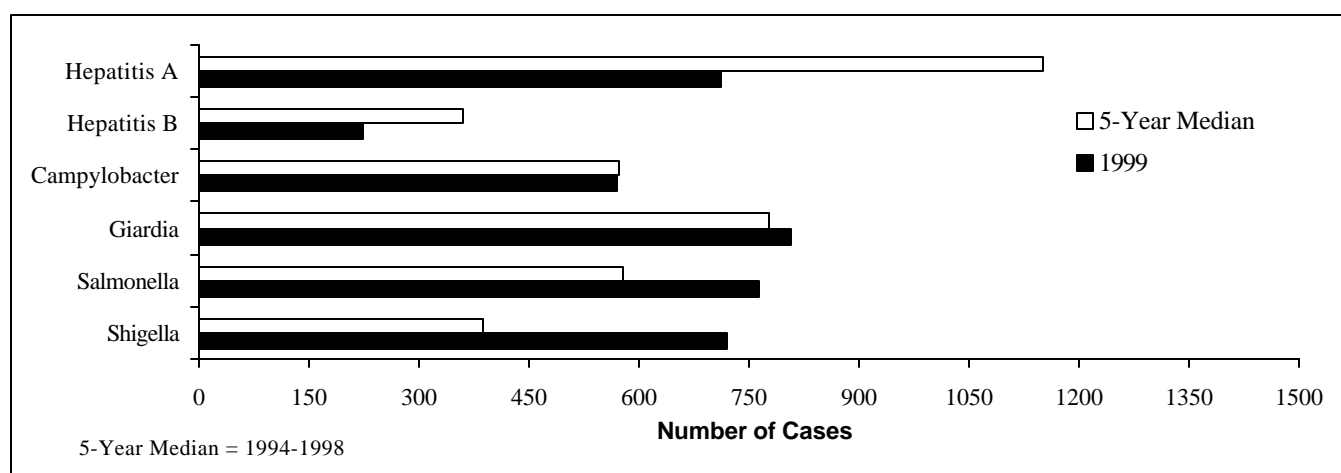
\*\*Totals do not include Kansas City, St. Louis City, St. Louis County, or Springfield

\*\*\*State and Federal Institutions and Unknown

\*\*\*\*Included in SW District

n/a Data unavailable

## Disease Reports, January–December 1999 and 5-Year Median



### Influenza

During the January–December 1999 time period, influenza cases increased to 2337 cases, which is a 114.6% increase from the 1089 cases reported in 1998. This is a 725.8% increase from the five-year median of 283. All six health districts showed an increase in influenza cases. During the 99-00 influenza season, new rapid testing methods were licensed. We believe patient and physician acceptance of the new testing method was high, accounting for the increase in laboratory-confirmed cases.

### Viral Hepatitis

During the January–December 1999 time period, hepatitis A cases increased to 712 cases, which is a 11.8% increase from the 637 cases reported in 1998. This is a 38.1% decline from the five-year median of 1151. The number of cases increased in the Eastern and Southeastern Districts from 1998 to 1999. The increase in Eastern and Southeastern Districts was due to outbreaks.

Hepatitis B decreased 11.1% from 252 cases in 1998 to 224 cases in 1999. However, the total of 1999 cases was 37.8% lower than the five-year median of 360.

### Enterics

Campylobacter increased slightly by 6.4% during 1999, from 535 cases in 1998 to 569 cases in 1999. The total number of 1999 cases declined 0.9% from the five-year median of 574 cases. Salmonella increased by 20.9% from 632 cases in 1998 to 764 cases in 1999. Five of the six health districts showed an increase in salmonella cases with outbreaks in four of the six districts. The four districts were Northwest, Southwest, Eastern and Central. Shigellosis cases increased significantly from 221 in 1998 to 720 in 1999. This is a 225.8% increase. The 720 cases represent a 86.0% increase from the five-year median. Five of the six health districts showed an increase in shigellosis cases with outbreaks in four of the six districts. The four districts were Northwest, Southwest, Southeast, and Central. Eastern District increased 212.6% from 119 cases in 1998 to 372 cases in 1999. Southwestern District increased 378.9% from 38 cases in 1998 to 182 cases in 1999.

### Parasites

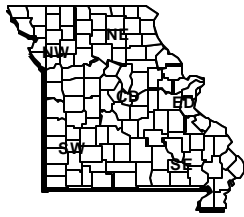
Giardiasis increased slightly by 2.2% during 1998, from 790 cases in 1998 to 807 cases in 1999. However, this is a slight 3.9% decrease from the five-year median of 777 cases.

### Meningitis

Meningococcal meningitis increased 80.0% during 1999, from 25 cases in 1998 to 45 cases in 1999. The five-year median is 43 cases. No meningococcal disease outbreaks were reported. Sporadic cases were reported.


### HIB Disease

Following no cases reported in 1996, one case reported in 1997, two cases reported in 1998, twelve cases of *Haemophilus influenzae* type b (Hib) meningitis were reported in Missouri during 1999. The five-year median is 2 cases. Other invasive cases (non-meningitis) of *Haemophilus influenzae* that may not be affected by the vaccine decreased 80.0% during 1999 from 10 cases in 1998 to 2 cases in 1999. The five year median is also 10 cases.



Missouri Department of Health  
Division of Environmental Health and Communicable Disease Prevention  
**QUARTERLY DISEASE REPORT**

Reporting Period\*  
**January - March, 2000**

	Districts											3 Month State Totals		Cumulative		
	CD	** ED	NE	** NW	SE	** SW	*** OTHER	Kansas City	St. Louis City	St. Louis Co.	Spfd. Greene Co.	2000	1999	For 2000	For 1999	5 YR MEDIAN
Vaccine Preventable																
Influenza	241	213	116	211	373	56	2	26	156	523	80	1997	757	1997	757	256
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Pertussis	0	0	0	3	1	1	0	0	0	1	0	6	10	6	10	9
Viral Hepatitis																
A	7	5	0	23	10	14	2	27	35	34	2	159	125	159	125	196
B	1	8	2	5	1	3	13	4	21	8	3	69	37	69	37	70
C	2	0	1	4	0	0	0	0	1	0	2	10	16	10	16	3
Non-A Non-B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis																
Meningococcal Disease	1	0	0	2	0	3	1	1	0	1	0	9	17	9	17	17
Meningococcal Other	1	1	0	2	0	2	1	2	3	8	1	21	11	21	11	13
Enteric Infections																
Campylobacter	19	6	2	4	3	19	1	9	3	9	3	78	86	78	86	86
E. Coli O157:H7	4	10	0	2	2	3	0	0	0	0	1	22	2	22	2	2
Salmonella	16	4	1	9	7	10	3	10	3	17	4	84	86	84	86	86
Shigella	4	2	3	11	16	9	4	28	17	25	5	124	120	124	120	120
Parasitic Infections																
Cryptosporidiosis	0	0	0	1	0	0	0	4	1	0	0	6	3	6	3	3
Giardiasis	11	19	8	13	6	18	10	6	29	36	3	159	127	159	127	133
Respiratory Diseases																
Legionellosis	0	0	0	0	1	1	0	0	0	1	0	3	4	3	4	4
Sexually Transmitted																
AIDS	5	1	1	4	3	3	9	28	27	11	3	95	85	95	85	116
HIV Infection	5	2	1	2	2	3	1	23	19	11	1	70	91	70	91	n/a
Chlamydia	273	124	89	175	254	334		903	624	583	179	3361	3461	3361	13355	12257
Gonorrhea	106	12	13	37	125	57		669	557	379	42	1956	1914	1956	8187	8415
P & S syphilis	0	1	0	0	1	0		0	4	9	0	15	31	15	99	118
Tuberculosis																
TB Disease	6	2	0	1	3	1	0	12	11	13	1	50	40	50	40	n/a
TB Infections	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zoonotic																
Ehrlichiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lyme Disease	1	4	0	2	0	0	0	0	0	0	0	7	5	7	5	5
Rabies (Animal)	0	0	1	1	1	0	0	0	0	0	0	3	6	3	6	8
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0
Tularemia	0	0	0	0	0	2	0	0	0	0	0	2	0	2	0	0

**Outbreaks**

Foodborne  
Waterborne  
Hepatitis A  
Shigella - 1  
Influenza or Flu-Like - 3  
Scabies - 2  
Group A Strep - 1  
Other - 7

**Low Frequency Vaccine Preventable Diseases**

Diphtheria  
Hib Meningitis - 3  
Hib other invasive  
Polio  
Rubella -  
Tetanus

**Low Frequency Diseases**

Anthrax  
Botulism  
Brucellosis  
Chancroid  
Cholera  
Encephalitis  
Granuloma Inguinale  
Kawasaki Disease  
Leptospirosis  
Listeria - 1  
Lymphogranuloma Venereum

Plague  
Psittacosis  
Rabies (human)  
Reye syndrome  
Rheumatic fever, acute  
Streptococcal Disease, Invasive, Grp A  
Streptococcus pneumoniae,  
Drug Resistant Invasive Disease  
Toxic Shock Syndrome -1  
Trichinosis - 1  
Typhoid Fever

\*Reporting Period Beginning January 2, 2000 and Ending April 1, 2000.

\*\*Totals do not include Kansas City, St. Louis City, St. Louis County, or Springfield

\*\*\*State and Federal Institutions and Unknown

\*\*\*\*Included in SW District

n/a Data unavailable

Due to data editing, totals may change.

# Update: Pulmonary Hemorrhage/Hemosiderosis Among Infants—Cleveland, Ohio, 1993–1996

Reprinted from the Centers for Disease Control and Prevention (CDC) *Morbidity and Mortality Weekly Report*, March 10, 2000, Vol. 49, No. 9.

A review within the Centers for Disease Control and Prevention (CDC) and by outside experts of an investigation of acute pulmonary hemorrhage/hemosiderosis in infants has identified shortcomings in the implementation and reporting of the investigation described in *MMWR*<sup>1-2</sup> and detailed in other scientific publications authored, in part, by CDC personnel.<sup>3-5</sup> The reviews led CDC to conclude that a possible association between acute pulmonary hemorrhage/hemosiderosis in infants and exposure to molds, specifically *Stachybotrys chartarum*, commonly referred to by its synonym *Stachybotrys atra*, was not proven. This report describes the specific findings of these internal and external reviews.

## Background

In December 1994 and January 1997, articles in *MMWR* described a cluster of 10\* infants from Cleveland, Ohio, with acute idiopathic pulmonary hemorrhage, also referred to as pulmonary hemosiderosis.<sup>1-2</sup> The children resided in seven contiguous postal tracts and had had one or more hemorrhagic episodes, resulting in one death, during January 1993–December 1994. Preliminary results of a CDC case-control study<sup>2</sup> indicated that hemorrhage was associated with

1. Major household water damage during the six months before illness and
2. Increased levels of measurable household fungi, including the toxin-producing mold *S. chartarum* (syn. *S. atra*).

\* The first report<sup>1</sup> described eight infants identified through November 1994. Two additional infants, identified in December 1994, were added to the original study.

These findings and the observation that tricothecene mycotoxins were produced in the laboratory by some *S. chartarum* isolates recovered from the homes of study subjects have been published and referenced in peer-reviewed scientific literature.<sup>3-9</sup> The hypothesis from the findings of the investigation was that infant pulmonary hemorrhage may be caused by exposure to potent mycotoxins produced by *S. chartarum* or other fungi growing in moist household environments.<sup>4-5</sup> The findings also were cited in environmental health guidelines<sup>10-11</sup>, congressional testimony<sup>12</sup>, and the popular media<sup>13-16</sup>, and have been debated among industrial hygienists and other occupational and environmental health scientists.<sup>17-21</sup> Despite caution that “further research is needed to determine...causal[ity]”<sup>4</sup>, the findings have influenced closure of public buildings, cleanup and remediation, and litigation.<sup>16, 22-28</sup>

In June 1997, a CDC scientific task force, in a review of the agency’s response to the problem, advised the CDC director that concerns about the role of *S. chartarum* in pulmonary hemorrhage needed to be addressed. In response, CDC convened a multidisciplinary internal group of senior scientists (working group) and sought the individual opinions of outside experts. The working group and the outside experts conducted separate reviews of the Cleveland investigation. The working group reviewed background literature, internal CDC documents, and published CDC reports; examined the data set; and interviewed the principal investigators. The external experts reviewed relevant literature, including internal CDC documents and the working group report, and invited additional consultants to address specific topics. The working group and the external consultants each concluded that further work is needed to better describe the clinical problem, its

public health impact, and the factors that put infants at risk.<sup>29-30</sup>

## Case Identification

The reviewers had concerns about the characterization of the clinical problem as “hemosiderosis.” The acute presentation in all ten cases, the narrow age distribution (6 weeks to 6 months), and the absence of iron deficiency suggest that the illness described in the cluster of cases in Cleveland<sup>1,3</sup> is clinically distinct from idiopathic pulmonary hemosiderosis (IPH), the condition to which this cluster was linked.<sup>31</sup> Hemosiderosis (i.e., hemosiderin-laden macrophages in the interstitium and alveolar spaces of the lung) is a pathologic finding indicative of pulmonary bleeding of any type, not a unique characteristic of a specific disease, etiology, or pathophysiologic process.<sup>32-33</sup> Therefore, in referring to the cluster of cases in Cleveland, the working group defined that cluster as acute idiopathic pulmonary hemosiderosis (AIPH) in infants. From the limited clinical and historic information available to the reviewers on cases added to the Cleveland series since the original cluster (D. Dearborn, Case Western Reserve Department of Pediatrics, personal communication, September 1999), the external consultants concluded that some of these additional cases<sup>6</sup>, including several identified in a retrospective review of sudden infant death syndrome cases<sup>2</sup>, do not conform to the clinical patterns of cases in the original cluster. Both groups of reviewers recognized limitations that precluded drawing conclusions about clinical or etiologic ties to IPH.

## Association of AIPH With Household Water Damage and Fungi

Both groups of reviewers concluded that the available evidence does not substantiate the reported epidemiologic

associations—between household water damage and AIPH<sup>3</sup> or between household fungi and AIPH<sup>4</sup>—or any inferences regarding causality. The interpretation of water damage and its association with AIPH was considered to have been hampered by the limited descriptive information, by the lack of standard criteria for water damage, and by the absence of a standard protocol for inspecting and recording information from home to home. Similarly, assessment of exposure to fungi or mycotoxin also was difficult to interpret because the methods did not distinguish between contamination and clinically meaningful exposure. No isolates or serologic evidence of exposure to fungi or mycotoxin were obtained in individual case-infants.

### Evaluation of Analysis Methods

Three factors, considered together, contributed to the groups' conclusions that *S. chartarum* was not clearly associated with AIPH:

1. The working group found that the reported odds ratio (OR) of 9.8 for a change of 10 colony-forming units (CFU) per m<sup>3</sup> was statistically unstable and potentially inflated.<sup>4</sup> The estimate was very sensitive to at least three influential steps or strategies in the analysis. First, the mean airborne *S. chartarum* concentrations (CFU/m<sup>3</sup>) for each household were calculated incorrectly. Substituting the corrected means reduced the OR by 44% to 5.5. Second, the mean *S. chartarum* value (CFU/m<sup>3</sup>) was imputed in one case home.<sup>†</sup> The sample was collected many months after sampling in the other case homes and, along with all other household samples collected at the same time, produced unusually heavy growth of non-*Stachybotrys* fungi, suggesting important differences in sampling technique, laboratory procedure, or environmental conditions at the time of the sampling. Exclusion of
2. Although the methods specified that sampling be done in a blinded manner<sup>4</sup>, one investigator correctly inferred the identity of many case homes and wanted to be certain to identify culturable fungi in these homes if they were present. As a result, the investigator collected twice the number of air samples from case homes as were collected from control homes. In addition, investigators used aggressive, nonstandardized methods to generate artificial aerosols for sampling (e.g., vacuuming carpets and pounding on furnace ducts and furniture<sup>4</sup>), increasing the potential for differential exposure assessments of cases and controls if sampling were conducted in an unblinded manner.
3. Among homes classified as water damaged, the presence of any culturable airborne *S. chartarum* was identified in similar percentages of case and control homes (four of eight compared with three of seven) (CDC, unpublished data, February 1997). Although the numbers were small, this provided little evidence of a difference in the presence of airborne *S. chartarum* between water-damaged case and control homes. If the classifications of water damage were correct, this would suggest that water damage, or an unrecognized correlate of water damage, may be confounding

any perceived association with *S. chartarum*.

Overall, the reviewers concluded that on the basis of these limitations the evidence from these studies was not of sufficient quality to support an association between *S. chartarum* and AIPH. In addition, the reviewers noted that evidence from other sources supporting a causal role of *S. chartarum* in AIPH is limited. First, AIPH is not consistent with historic accounts of animal and human illness caused by *S. chartarum* or related toxigenic fungi. Second, clusters of AIPH have not been reported in other flood-prone areas where growth of *S. chartarum* or other toxigenic fungi might be favored. Third, the mold-disease association observed in the Cleveland investigation was not observed in the investigation of a similar cluster in Chicago (34; CDC, unpublished data, May 1997).

*Reported by: Office of the Director, CDC.*

**Editorial Note:** On the basis of the findings and conclusions in the reports of the CDC internal working group and the individual opinions of the external consultants, CDC advises that conclusions regarding the possible association between cases of pulmonary hemorrhage/hemosiderosis in infants in Cleveland and household water damage or exposure to *S. chartarum* are not substantiated adequately by the scientific evidence produced in the CDC investigation.<sup>2-4</sup> Serious shortcomings in the collection, analysis, and reporting of data resulted in inflated measures of association and restricted interpretation of the reports. The associations should be considered not proven; the etiology of AIPH is unresolved.

As a result of the reviews, CDC will implement the following:

1. CDC will continue to investigate cases of AIPH in infants, particularly when clusters of cases can be identified.
2. CDC will continue to consider possible associations between AIPH and many

(continued on page 22)

<sup>†</sup> An imputed value, 4 CFU/m<sup>3</sup> (half the limit of detection divided by the number of plates), was used because colonies were detected on one or more of the plates, but were too few to count on the final platings and, therefore, recorded in the laboratory record as 0 CFU/m<sup>3</sup>.

<sup>§</sup> The working group's reported reanalysis used the value originally coded in the laboratory record (0 CFU/m<sup>3</sup>). The result was identical to that obtained by excluding the household from the analysis.

(continued from page 21)

possible etiologies, including household water damage or exposure to environmental hydrophilic fungi/molds such as *S. chartarum*. Standardized protocols will be recommended for data collection and environmental assessment.

3. CDC will assist in implementation of surveillance for individual cases or clusters of cases of AIPH in infants.
4. In collaboration with pediatric pulmonary specialists and with state and local health officials, a consistent standard surveillance case definition will be developed for reporting.
5. As part of future CDC investigations, CDC will enhance sampling and laboratory analytic methods to improve assessment of environmental exposures to molds/fungi.


Copies of the report of the working group and a synthesis prepared by CDC of the reports individually submitted by the external experts can be accessed at <http://www.cdc.gov/od/ads>, then click on "Pulmonary Hemorrhage/Hemosiderosis Among Infants."

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## LATE BREAKERS

 **Emergency Rule Changes**—The Missouri Department of Health has promulgated emergency amendments to the following rules:

- 19 CSR 20-20.010, Definitions Relating to Communicable, Environmental and Occupational Diseases;
- 19 CSR 20-20.020, Reporting Communicable, Environmental and Occupational Diseases;
- 19 CSR 20-26.030, Human Immunodeficiency Virus (HIV) Test Consultation and Reporting;
- 19 CSR 20-26.040, Physician Human Immunodeficiency Virus (HIV) Test Consultation and Reporting.

In addition, the Department is rescinding 19 CSR 20-20.080, Duties of Laboratories, and promulgating an emergency rule of the same name and number. **Correction from the March-April 2000 issue of the *Missouri Epidemiologist*.** The emergency amendments/rule became effective on June 15, 2000. They were published, along with an amendment to 19 CSR 20-26.070, Notification of Results of Court-Ordered HIV Testing of Sexual Offenders, on July 3, 2000 in the *Missouri Register*. All proposed rule changes have a 30-day comment period as part of the rulemaking process. The *Missouri Register* may be accessed through the Missouri Secretary of State home page at <http://mosl.sos.state.mo.us/moreg/moreg.htm>.

 **Revised Influenza Immunization Recommendations for 2000–2001**—The Centers for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP) issued revised recommendations for influenza immunization for the 2000–2001 season. The recommendations were published in the June 30 *MMWR*. You can access the most recent issues of the *MMWR* at <http://www2.cdc.gov/mmwr/>. If you do not have access to the internet and would like a hard copy of the information, please contact the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313 to request a copy.

 The Section of STD/HIV/AIDS Prevention and Care Services web pages have been updated. These web pages contain information on HIV/AIDS care programs, STD/HIV prevention programs, HIV counseling and testing sites, the STD manual, informational links, etc. The web pages can be accessed at <http://www.health.state.mo.us/sshapcs/SSHAPCS.html>. For more information, please contact the Section of STD/HIV/AIDS Prevention and Care Services at (800) 359-6259.

# Tickborne Disease Summary – 1999

Howard L. Pue, D.V.M., M.S.V.P.M.  
Office of Surveillance

## Ticks of Missouri

Missouri, with its natural climatic conditions of heat and moisture, is an ideal ecological setting for an abundance of tick species. The ticks usually found in Missouri are:

- *Amblyomma americanum* or Lone Star Tick—Considered the primary vector of tularemia in Missouri.
- *Amblyomma maculatum*—Considered a probable vector of tularemia and possibly Rocky Mountain Spotted Fever (RMSF) in Missouri.
- *Dermacentor variabilis* or American Dog Tick—Considered the primary vector of RMSF in Missouri.
- *Rhipicephalus sanguineus* or Brown Dog Tick—Considered the vector of ehrlichiosis in dogs in Missouri. At one time considered a vector of ehrlichiosis in humans, but this theory has not been proven.
- *Ixodes scapularis* or Deer or Wood Tick—Considered the possible vector of borreliosis in Missouri.

While the above ticks are thought to be the prime vectors of specific diseases, it does not mean, for example, that *Amblyomma americanum* could not transmit RMSF, ehrlichiosis or a *Borrelia* species. From a purely scientific perspective, if a certain species of tick has the anatomical and physiological capabilities to transmit a disease, it could be assumed that this species could be capable of transmitting another disease. Indeed this does sporadically happen. *Amblyomma americanum* has the capability to transmit tularemia and RMSF. It has been successfully infected with *Borrelia burgdorferi* in the laboratory and found to transmit the organism. However, it did not remain infected. The role of this tick in the transmission of borreliosis in nature is not known.

In nature there are many variables that affect a specific organism, the ecology of each tick species, and the environment that make a given species a viable vector of a certain disease. Unfortunately, not all of these factors are known or understood. What is known is that a human is not the natural host for any tick. The above-mentioned ticks may bite humans as a means of last resort or of favorable opportunism. Since humans

are not the normal host, the *Amblyomma* and *Dermacentor* species must spend four to six hours acclimating to the human host prior to taking a blood meal and thus potentially transmitting the disease. The *Ixodes* species must acclimate for 12–20 hours to the human host prior to taking a blood meal. So during the period of acclimatization, although the tick may be attached by inserting its mouthparts into the skin, it does not start a blood meal, and consequently, cannot regurgitate the organism into the new host.

Of the millions of vector ticks in nature, only a small percent are likely to be infected. In population studies of ticks, if three to five percent are found to be infected with a disease organism, it is considered high. Thus, most ticks are not carriers of disease, and testing individual ticks for disease organisms is usually not productive or cost effective.

Tick feeding activity does produce host reactions caused by the ticks' salivary fluids and toxins, and skin lesions that may occur are susceptible to secondary bacterial infections. This local reaction at times can be very severe.

## Epidemiology of Tickborne Diseases

RMSF accounts for 90 percent of the rickettsial diseases that occur annually in the United States. During the 1980s, approximately 50 deaths per year in the United States were attributed to RMSF. An endemic focus for RMSF exists in Missouri, Arkansas, Oklahoma and Texas. In 1999, 16 cases of RMSF were reported in Missouri compared to five cases in 1998. Over the preceding ten-year period (1989–1998), the highest number of cases (48) occurred in 1989, and the lowest number of cases (5) occurred in 1998. The ten-year median (1989–1998) is 24 cases per year. No human deaths due to RMSF were reported in Missouri during 1999, although five deaths have been attributed to this disease since 1989.

## Tickborne Disease Alert

Due to the mild winter and early spring, there is an abundance of ticks in Missouri this year. The Missouri Department of Health has already received a number of reports of tickborne diseases.

Patients with a tickborne illness may complain of fever, headache, myalgia, nausea, vomiting or malaise. A petechial or erythema migrans rash may also be present. Clinicians are asked to consider tickborne syndromes in their differential diagnosis of febrile illness with headache, especially if there has been a recent tick exposure. Patients with tickborne disease should be treated with an appropriate antibiotic.

Rocky Mountain spotted fever, ehrlichiosis, tularemia and Lyme disease are reportable to the Missouri Department of Health. For additional information, contact the Section of Communicable Disease Control and Veterinary Public Health at (800) 392-0272.

Tularemia is enzootic in animals in Missouri. In addition to tickborne transmission, this disease can be spread by many other routes, including ingestion, inhalation, and contamination of skin and mucous membranes with infectious materials. In 1999, 19 cases of tularemia were reported in Missouri, compared to 12 cases in 1998. Over the preceding ten years, the highest number of cases (44) occurred in 1991, and the lowest number of cases (9) occurred in 1996. The ten-year median for this period is 24.5 cases per year. No human deaths due to tularemia were reported in Missouri during 1999, although four deaths have been attributed to this disease since 1989.

Missouri continues to account for the majority of ehrlichiosis cases reported nationally, with central Missouri being the epicenter. In 1999, 56 cases of ehrlichiosis were reported in Missouri, compared to 12 cases in 1998. All human cases prior to 1999 were considered to be human monocytic ehrlichiosis (HME). In 1999, in addition to 52 cases of HME, four cases of human granulocytic ehrlichiosis (HGE) were reported. Over the preceding ten years, the highest number of cases (32) occurred in 1996, and the lowest number of cases (11) occurred in 1995. The ten-year median is 16 cases per year. One human death due to ehrlichiosis was reported in Missouri during 1999. Another individual died in 1999 due to "ricketsial illness" which most likely was an ehrlichiosis infection. Six deaths have been specifically attributed to this disease since 1989.

Borreliosis is a serious vectorborne disease in the United States. Borreliosis is a general term which includes both Lyme and Lyme-like illness, as both are thought to be caused by *Borrelia* organisms. Ninety percent of all cases are reported from the northeastern United States. In 1999, 72 cases of borreliosis were reported in Missouri that met the surveillance case criteria for Lyme disease set by the Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE). Twelve cases of borreliosis were

reported in Missouri during 1998. Over the preceding ten years, the highest number of cases (207) occurred in 1991, and the lowest number of cases (12) occurred in 1998. The ten-year median is 105 cases per year. No human deaths due to borreliosis were reported in Missouri during 1999, although two deaths have been attributed to this disease since 1989.

Human cases of the diseases noted above all increased from 1998 to 1999 in Missouri. However, all remained below their respective ten-year medians with the exception of ehrlichiosis. A portion of these increases can be attributed to better awareness on the part of medical providers, health agencies, and the general public concerning the threat of tickborne illnesses across the state. Also, diagnostic tools are being developed that are faster, less expensive, and more sensitive than their predecessors. For example, portions of the Missouri medical community collaborated with CDC during 1999 to enhance the detection of ehrlichiosis and borreliosis using techniques such as polymerase chain reaction (PCR) testing.

### Prevention of Tickborne Diseases

Persons whose occupations, pastimes, or home environments place them at risk for these diseases should be instructed to:

- Wear light-colored clothing covering legs and arms.
- Tuck pants into socks or boots and apply tick repellent (permethrin to clothing, DEET-containing repellent to skin). Recommendations to use chemicals should include emphasis on following label directions pertaining to age restrictions, method of application, frequency of use, etc.
- Search total body for ticks every 3–4 hours; remove ticks immediately without crushing.
- Minimize tick populations around residential properties by removing potential hosts (e.g., rodents, stray animals), habitat modification (e.g.,

mowing), and chemical control as a last resort.

- De-tick dogs and cats to minimize exposure to family members.
- Seek medical attention if fever or illness develops soon after a tick bite or exposure to a tick-infected area.

### Why Reporting is Important

Disease surveillance cannot be accomplished by any single group. In essence, it is the compilation of contributions by health care providers, veterinarians, patients, hospital and medical communities, and local, state and national public health agencies.

Disease reporting is an important component of health care. Analyzing disease occurrence by person, place and time as well as studying the characteristics of the disease and its effect on the population are vital steps in the process of implementing and revising prevention activities to protect the community. Knowing geographically where specific diseases are occurring and in what populations is important information for prevention. This information also alerts physicians and other providers to new or emerging diseases that may be appearing in their patient populations. In addition, vectorborne diseases recognized in a specific location can be controlled to prevent further disease spread.

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### Tickborne Diseases Web Sites

**Centers for Disease Control and Prevention: Human Ehrlichiosis in the United States**

<http://www.cdc.gov/ncidod/dvrd/ehrlichia/Index.htm>

**Centers for Disease Control and Prevention: Lyme Disease**

<http://www.cdc.gov/ncidod/dvbid/Lymeinfo.htm>

**U.S. National Library of Medicine: Tularemia**

<http://medlineplus.adam.com/ency/article/000856.htm>

# 1999 Mosquitoborne Disease Surveillance Program

Howard L. Pue, D.V.M., M.S.V.P.M.  
Office of Surveillance

The Department of Health conducted surveillance programs for St. Louis (SLE), Western equine (WEE), Eastern equine (EEE), and LaCrosse (LAC) encephalitis during the 1999 mosquito season. The following active surveillance systems were operational during that period:

- Active Surveillance for Human Cases of Disease
- Active Surveillance for Equine Cases of Disease
- Active Surveillance for Arbovirus Activity in Wild Birds
- Active Surveillance for Arbovirus Activity in Mosquitoes

## Active Surveillance for Human Cases of Disease

Human arbovirus surveillance activities consisted of standard reporting by physicians in addition to statewide telephone contact with approximately 88 pre-designated key hospitals on a weekly basis through the sentinel active surveillance system. No cases of human arboviral encephalitis were detected in Missouri last year.

## Active Surveillance for Equine Cases of Disease

Thirteen veterinarians throughout the state were contacted by telephone on a weekly basis. All reports indicated no arboviral activity in horses in Missouri in 1999.

## Active Surveillance for Arbovirus Activity in Wild Birds

Trapping of wild birds began on June 3 and concluded on October 15, 1999 via a cost-reimbursement contract with the United States Department of Agriculture–Wildlife Service. Blood specimens from a total of 1,003 wild birds, comprised primarily of House Sparrows (*Passer domesticus*), were collected. Bird

collection sites were chosen from the following 14 counties: Boone, Callaway, Cape Girardeau, Clay, Cole, Daviess, Jackson, Lawrence, Lewis, Marion, Montgomery, New Madrid, St. Charles, and St. Louis. Japanese mist nets were deployed at locations in close proximity to livestock and human activity (e.g., horse stables, dairy farms, hog lots, sheep farms). Collections from each geographic area were made at approximately two- to three-week intervals. Specimens were sent to the Veterinary Medical Diagnostic Laboratory at the University of Missouri–Columbia under a contract with the Department of Health and tested for SLE and WEE. Enzyme linked immunosorbent assay (ELISA) techniques designed for detection of IgM antibody specific for the above viruses were used. Suspect positives were submitted to the Centers for Disease Control and Prevention (CDC) at Fort Collins, Colorado for confirmation. Blood samples from three sparrows captured in the Kansas City area were reactive for SLE virus.

## Active Surveillance for Arbovirus Activity in Mosquitoes

Mosquito collections were conducted in the eastern Missouri counties of Cape Girardeau and St. Louis and the city of St. Louis. Because these areas were most devastated by the 1993–95 floods, they serve as an excellent representative of the mosquito ecological set. Adult mosquito collections varied by site, but as a whole began on June 1, 1999 and terminated on September 9, 1999. Trapping was accomplished with CO<sub>2</sub> baited CDC and EVS Light Traps, Reiter Gravid Traps, and hand collection at selected resting stations by aspirator.

The Virology Laboratory at Southeast Missouri State University assayed potential vector mosquitoes for SLE, WEE, EEE, and LAC antigens by antigen capture ELISA. Pools included approximately 21,008 specimens of *Aedes albopictus*, *Aedes triseriatus*, *Coquillettidia perturbans*, and *Culex pipiens*.

*Aedes albopictus* and *Coquillettidia perturbans* were tested for EEE, *Aedes albopictus* and *Aedes triseriatus* were tested for LAC, and *Culex pipiens* complex (CPC) mosquitoes were assayed for SLE and WEE. A total of 961 pools of mosquitoes were tested. All tests were negative, indicating that arboviral activity was not occurring or could not be detected in mosquitoes in these areas.

CPC mosquitoes comprised 20,436 (97%) of the 21,008 vector specimens collected in 1999. However, the number of CPC mosquitoes collected that year was less than in preceding years. In Cape Girardeau County, fewer CPC mosquitoes were collected in 1999 than in each of the years from 1994 through 1998, and the number of mosquitoes per collection (collection index) was lower in 1999 compared to the previous five years. The same sites, baits, and traps were used as in 1998, but the collection index in 1999 (34.2) was less than one-half of the 1998 level (69.7). Similar findings were observed in St. Louis County and City. In St. Louis County, the number of CPC mosquitoes trapped and the collection index for 1999 were less than each of the previous five years. In St. Louis City, the number of CPC mosquitoes trapped and collection index for 1999 were exceeded only once (1997) during the period 1994–1998.

Obviously, the lower the number of vector mosquitoes, the less chance there is for disease transmission. However, monitoring the relative number of mosquitoes from year to year is not a foolproof method for predicting disease burden. Other factors come into play, such as immune status of reservoirs and human hosts, reservoir density, and of course, whether or not the virus is present. Also, predicting mosquito density based on rainfall totals is very tricky. Normally, very wet summers are associated with increased mosquito populations, but actually, hot, dry periods can facilitate mosquito breeding. As water evaporates

from breeding sites, they become more nutrient rich and are capable of supporting greater mosquito populations. If the sites dry up entirely (which occurred in many areas of Missouri last year), then mosquito populations decrease. If mid and late summer rains come along (as happened in New York City last year), then mosquito populations surge and the potential for arboviral transmission increases accordingly.<sup>1</sup>

### **Arbovirus Surveillance During 2000**

The routine surveillance activities described above provide an effective framework that can be quickly expanded in the face of public health threats such as floods or the introduction of new pathogens. Surveillance activities conducted during 2000 will be enhanced by:

- Collecting blood specimens from wild birds in up to 16 (instead of 14) counties. Counties covered under this program will be slightly modified to ensure optimum coverage with respect to population centers and disease threats.
- Using the test for SLE virus as a screen for West Nile Virus when testing bird blood specimens and pools of mosquitoes. Samples with suspect test results will be sent to CDC for confirmation.
- Testing mosquito pools directly for West Nile Virus when specific reagents become available from CDC.
- Assisting cities and counties that have mosquito trapping programs in having specimens tested for arboviruses at no cost (other than shipping) under the Department of Health's existing contract with Southeast Missouri State University. The number of specimens that can be tested is limited, and arrangements for testing must be made through the department.

### **REFERENCE:**

1. Personal communication, Christina L. Frazier, PhD, Southeast Missouri State University, May 22, 2000.

## **New Tuberculosis Recommendations**

The American Thoracic Society (ATS) and the Centers for Disease Control and Prevention (CDC) have released new recommendations for targeted tuberculin skin testing and the treatment of latent tuberculosis infection (LTBI), and revised standards for the diagnosis and classification of tuberculosis (TB). The changes from prior recommendations include:

- Emphasis on targeted TB skin testing among persons at high risk for recent TB infection or clinical conditions that increase the risk for TB disease.
- The LTBI treatment regimen of INH for nine months for HIV-negative adults is considered optimal; however, INH for six months is still acceptable.
- For patients who cannot tolerate INH, a two-month regimen of rifampin/pyrazinamide or a four-month regimen of rifampin are also acceptable.
- Routine baseline and follow-up laboratory monitoring is not needed in most persons with latent TB infection, except for those with HIV infection, pregnant women (or those in the immediate postpartum period), and persons with chronic liver disease or those who use alcohol regularly. All patients on INH need monthly evaluation for signs and symptoms of hepatitis, and instructions to call the health department immediately should they develop signs and symptoms between assessments.

The new recommendations are described in the following ATS and CDC joint statements:

- ✓ **Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection**
- ✓ **Diagnostic Standards and Classification of Tuberculosis in Adults and Children**

The web versions of the statements are available at [www.cdc.gov/nchstp/tb/](http://www.cdc.gov/nchstp/tb/) or [www.thoracic.org/statementframe](http://www.thoracic.org/statementframe).

CDC has also released the **Core Curriculum on Tuberculosis, 4th Edition, 2000**, which is available at [www.cdc.gov/nchstp/tb/](http://www.cdc.gov/nchstp/tb/) for viewing.

To order hard copy versions of these materials you can access the CDC's on-line order form at [www.cdc.gov/nchstp/tb](http://www.cdc.gov/nchstp/tb) or call the CDC Voice and FAX Information System (recording) toll free at (888) 232-3228.

If you have questions about the recommendations, please call the Section of Vaccine-Preventable and Tuberculosis Disease Elimination, Missouri Department Health at (800) 611-2912



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## Upcoming Conference

### **Emerging Infections of the Central States (EICS) announces its Second Annual Conference**

**October 27 and 28, 2000  
St. Luke's Hospital of Kansas City  
Kansas City, Missouri**

EICS, a region-wide health care organization formed to study Lyme disease and other emerging infectious diseases in Missouri and neighboring states, will hold its Second Annual Conference at St. Luke's Hospital of Kansas City in Kansas City, Missouri on Friday, October 27 and Saturday, October 28. Presentations by physicians on various topics will be open to the professional medical community for CME credit on Friday, October 27, and to the medical community and the general public on Saturday, October 28. Admission will be charged.

The recently formed and growing organization includes practicing physicians from across Missouri and Kansas, academic physicians and scientists from the University of Missouri and public health officials from the Missouri Department of Health. The organization is open to interested health care professionals and scientists in the central states (Arkansas, Illinois, Iowa, Kansas, Missouri, Oklahoma, Nebraska and South Dakota).

For further information, please contact : Ms. Karen Iadanza of EICS at (573) 814-6000 Ext. 3712.

Email: [karen.iadanza@med.va.gov](mailto:karen.iadanza@med.va.gov)



## Missouri Syphilis Elimination Project

Don Conner, PA-C  
St. Louis City Department of Health  
and Hospitals, STD Program

Amy L. Holterman  
Section of STD/HIV/AIDS Prevention  
and Care Services

As we begin the 21st century, syphilis rates in the United States are at the lowest rate ever recorded—2.6 per 100,000 people. In addition, and perhaps more importantly, the remaining cases of syphilis are confined to a small number of geographic areas. Nationwide in 1998, over 50 percent of primary and secondary (P&S) syphilis cases were reported from only 28 counties, mostly concentrated in the southern United States. Syphilis is also preventable and curable, providing patients have adequate access to and utilization of care. Moreover, other industrialized countries have already eliminated syphilis from within their borders.

With the above factors in mind, the Centers for Disease Control and Prevention (CDC) determined that the United States now has an opportunity to eliminate syphilis. In October 1999, CDC unveiled a plan to accomplish this objective by 2005. The *National Plan to Eliminate Syphilis from the United States* defined elimination as the absence of sustained disease transmission. The national goal is to reduce the annual number of P&S syphilis cases to 1,000 or fewer, and to increase the number of syphilis free counties to 90 percent, within the next five years.

Elimination of syphilis would have far-reaching positive implications for public health. One such implication would be the removal of a serious infectious disease which very disproportionately affects certain populations of African Americans. (In Missouri in 1999, the rate of reported cases of P&S syphilis was 39 times higher in African Americans than in whites.) In addition, syphilis elimination, as defined by CDC, would decrease the likelihood of HIV transmission, as well as essentially eliminate the occurrence of congenital syphilis. Syphilis elimination would also reduce health care spending (it is estimated that more than \$996 million is spent annually on syphilis nationwide).

To assist in elimination efforts, CDC has made additional funding available for areas that are still experiencing sustained disease transmission. Based on the high P&S syphilis rate in St. Louis City, which is six times greater than the national rate, Missouri received a portion of this funding for activities directed toward elimination in St. Louis City. While the number of cases has continued to decline since the last peak of syphilis in 1993, St. Louis City still ranked 20th in the nation among counties and independent cities in the number of new cases of P&S syphilis reported in 1998. In 1999, St. Louis City ranked 8th in the nation.

New strategies will need to be implemented along with previously utilized methods for preventing and controlling the spread of infection if the syphilis

elimination project is to be successful. CDC has outlined five such strategies in the national plan.<sup>1</sup>

- **Enhanced Surveillance** – Enhance detection, monitoring and data analysis of syphilis cases and exposed sex partners.
- **Strengthened Community Involvement and Partnerships** – Collaboration with affected communities, and organizations that represent these communities, to develop and implement syphilis elimination plans.
- **Rapid Outbreak Response** – Identification of outbreaks based on locally determined thresholds and interruption of transmission.
- **Expanded Clinical and Laboratory Services** – Expanded and intensified activities that promote access to and

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utilization of care for persons infected with or exposed to syphilis.

- **Enhanced Health Promotion** – Development of activities that promote increased sexual health and/or modification of behaviors that place persons at risk.

Using the national plan as a “blueprint,” St. Louis City has undertaken the following activities to assist in the elimination of syphilis:

- Improving capabilities to rapidly detect new cases. To accomplish this, the St. Louis City Health Department is working with major laboratories that have a history of reporting syphilis to assure both the accuracy and timeliness of reporting. The St. Louis City Health Department is also working with Washington University to maintain physician awareness of syphilis and emphasize the need for complete and timely reporting. Even during non-epidemic periods, the medical community needs to be taking appropriate sexual behavior histories on all patients, and performing thorough exams (including appropriate laboratory tests) on all at-risk individuals.
- Seeking venues to engage at-risk populations in health promotion activities that educate and reduce risk. This includes presentations that cover disease signs and symptoms, as well as safer sex and abstinence-based risk reduction. St. Louis City's Sexually Transmitted Disease (STD) Program will be conducting a number of mobile outreach and screening events based on epidemiologic data from enhanced surveillance activities. Neighborhoods where new cases have been identified or where there is evidence of high-risk behaviors will be actively targeted. The STD Program is also developing strong collaborations with St. Louis City's jail, holdover facility, medium security institution and court system to provide STD services, which will include screening and prevention education, to prisoners.

- Forming a Community Syphilis Elimination Advisory Group. This group will assist the St. Louis City Health Department in its efforts to design and implement culturally sensitive and specific interventions. Recruitment of community leaders, clergy, health agency personnel and members of the affected communities to collaborate with the STD Program will be a major component of this project. The St. Louis City Health Department is also seeking a community-based organization (CBO) to partner with it to provide greater access to at-risk populations. Requests for proposals from CBOs are currently being accepted.
- Collaborating with St. Louis University and Washington University in conducting research into the conditions that contribute to the high rates of disease in the St. Louis community. Specific interventions are being designed for high-risk groups such as sex workers and men who have sex with men (MSM).

If you would like further information about the syphilis elimination project, contact the Section of STD/HIV/AIDS Prevention and Care Services at (800) 359-6259, or visit our web site at [www.health.state.mo.us/sshapcs/SSHASPCS.html](http://www.health.state.mo.us/sshapcs/SSHASPCS.html).

### **Why should medical providers report diagnosed cases of syphilis?**

- It is required by Missouri Department of Health's communicable disease rule 19 CSR 20-20.020.
- It assists in halting the spread of disease, and thus prevents the transmission of the infection from infected pregnant females to their unborn children.

### **What is done with received reports?**

- Public health officials analyze the reports and determine the potential

for an outbreak to occur, or determine if an outbreak is already occurring.

- Public health officials also analyze data on reported cases in order to characterize the occurrence of syphilis in different areas and different population groups. As a result, prevention activities can be better designed and evaluated.
- Information contained in the reports allows implementation of partner notification, which can assist in halting further spread of disease.
- Reports are handled in a confidential manner, and information contained in the reports will only be released to authorized personnel. Information provided to CDC does not contain any identifying information on individual patients. It is important to remember that funding levels may depend on the number of cases identified in a particular area. It is possible that by identifying additional cases of disease, additional funds may be obtained to help your community.

### **What are the benefits of partner notification?**

- Rapid notification of exposed partner(s) (some of whom may be asymptomatic) that they have been exposed to a dangerous disease.<sup>2</sup>
- Treatment of infected partners to stop the spread of disease and prevent complications.<sup>2</sup>
- Prophylactic treatment of partners testing negative (but possibly infected) to prevent potential disease and transmission to others.<sup>2</sup>
- Decrease in disease incidence as the chain of infection is broken.<sup>2</sup>
- Provides partners with crucial health information, counseling, and risk reduction techniques.<sup>3</sup>
- Confidential notification of partners (by trained public health outreach workers) if the patient is unwilling or unable to do this.<sup>3</sup>

(continued on page 12)

# Tuberculosis Annual Report for 1999

Vic Tomlinson

Lynelle Phillips

Section of Vaccine-Preventable and  
Tuberculosis Disease Elimination

The number of reported tuberculosis cases nationwide continued to decrease in 1999. According to the Centers for Disease Control and Prevention (CDC), 17,528 cases of tuberculosis were reported in 1999, representing a 4.5 percent decrease from the 18,361 cases reported in 1998. This represents the seventh consecutive year that tuberculosis cases have decreased nationally.

In Missouri, the number of reported tuberculosis cases actually increased by 13 percent, from 184 cases in 1998 to 208 cases in 1999. The case rate also increased from 3.4 to 3.9 per 100,000 population. (See Figure 1.)

The major metropolitan areas of St. Louis City, St. Louis County, Kansas City and Springfield-Greene County accounted for 63 percent of reported cases in Missouri during 1999 as compared to 66 percent in 1998. Rural areas accounted for 37 percent of the cases in 1999 compared to 34 percent in

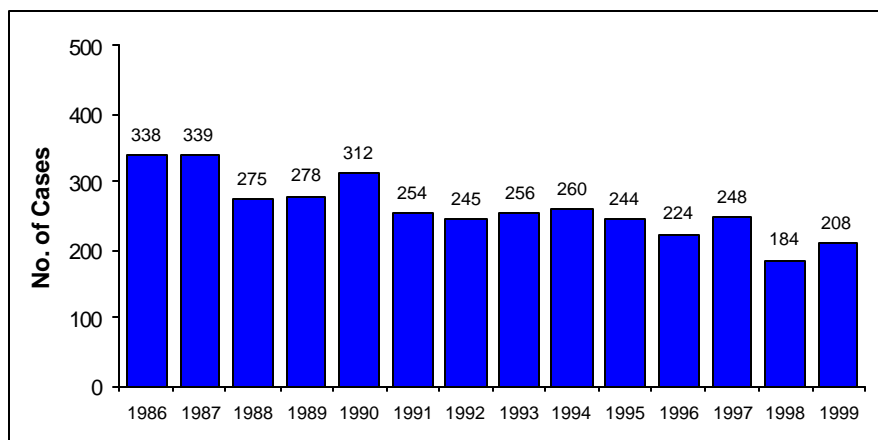


Figure 1. Reported tuberculosis cases by year, Missouri, 1986–99.

1998. For 1999, three of the four major metropolitan areas experienced increases in the number of reported cases. St. Louis County increased from 21 to 35 cases (66.7%), Kansas City, increased from 39 to 42 cases (7.7%), and Springfield-Greene County increased from 6 to 13 cases (116.7%). St. Louis City decreased from 55 to 42 cases (-23.6%). The case rates for these areas in 1999 were 3.5 per 100,000 for St. Louis County, 9.5 for Kansas City, 5.8 for Springfield-Greene County, and 12.3 for St. Louis City. (See Figure 2.)

The number of reported cases in the rural areas increased 20.6 percent, from 63 cases in 1998 to 76 cases in 1999. Increases were noted in two of the six public health districts in Missouri. The Southeastern District increased from 11 to 24 cases (118.2%) and the Eastern District increased from six to seven cases (16.7%). The Northeastern District decreased from four to two cases (-50.0%); the Central District decreased from 15 to 13 cases (-13.3%); the Southwestern District decreased from

(continued on page 4)

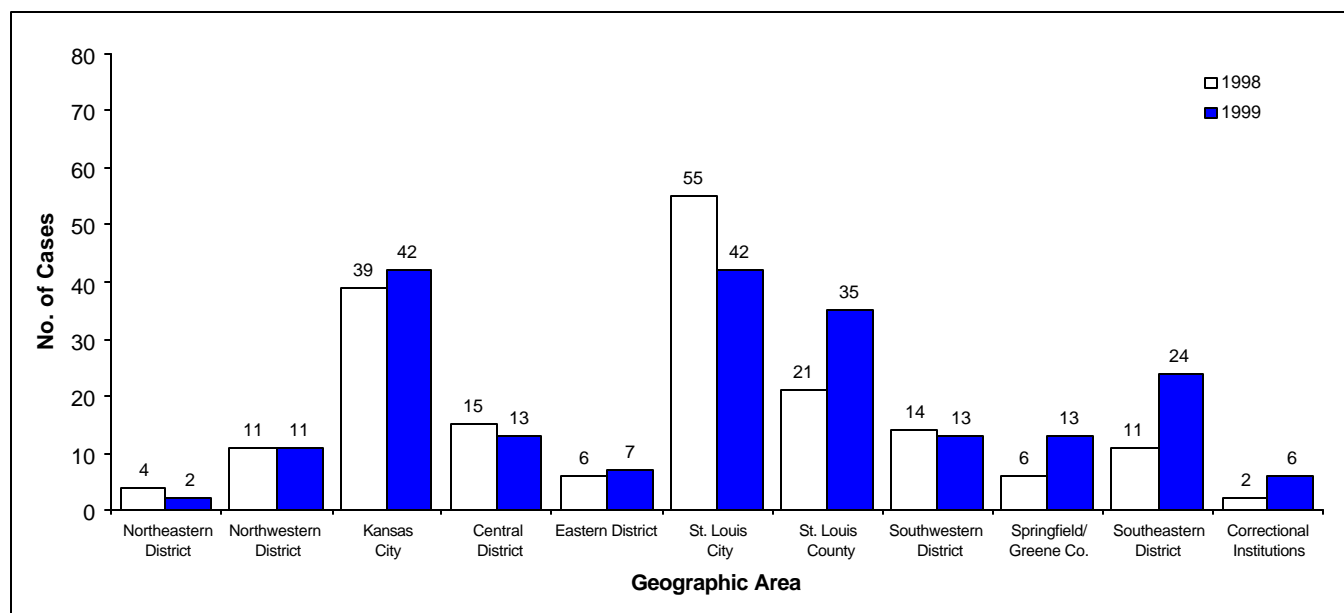


Figure 2. Reported tuberculosis cases by geographic area, Missouri, 1998 and 1999.

(continued from page 3)

14 to 13 cases (-7.1%); and the Northwestern District remained the same as the previous year at 11 cases. An increase from two to six cases (200.0%) was observed in state and federal correctional institutions. (See Figure 2 on page 3.)

Reported cases of tuberculosis among males continued to outnumber those in females. In 1999, 129 (62.0%) of the cases were male and 79 (37.9%) were female. In 1998, 123 (67.0%) of the cases were male and 61 (33.0%) were female.

In 1999, individuals with active tuberculosis disease ranged in age from less than one to 92 years. Increases in reported cases were observed in all but the 45-64 age group. The largest number of cases occurred in persons age 65 and older accounting for 34.1 percent of the reported cases. In 1998, the percentage was approximately the same at 34 percent. In 1999, 2.4 percent (5/208) of the reported tuberculosis cases occurred among patients in nursing homes. These facilities accounted for 6.0 percent (11/184) of the reported cases in 1998. The Section of Vaccine-Preventable and Tuberculosis Disease Elimination continues to address this issue by working closely with nursing home associations, residential care associations and the Division of Aging to provide facilities with the recommendations for tuberculin skin testing and follow-up of residents and employees. It is significant to note that the number of reported cases in persons less than 15 years of age increased 125 percent from 8 in 1998 to 18 in 1999. (See Figure 3.)

Tuberculosis case rates vary significantly among racial and ethnic groups. From 1998 to 1999, case rates per 100,000 population decreased among whites (from 1.9 to 1.8); decreased significantly in Hispanics (from 20.2 to 9.2); increased in blacks (from 12.8 to 15.5); and increased in Asians (from 34.0 to 39.8). The case rate among blacks and Asians is noticeably high. (See

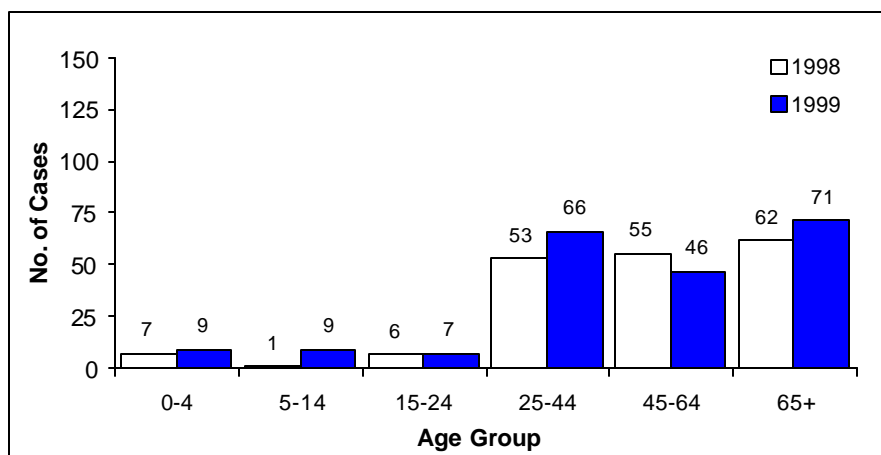


Figure 3. Reported tuberculosis cases by age group, Missouri, 1998 and 1999.

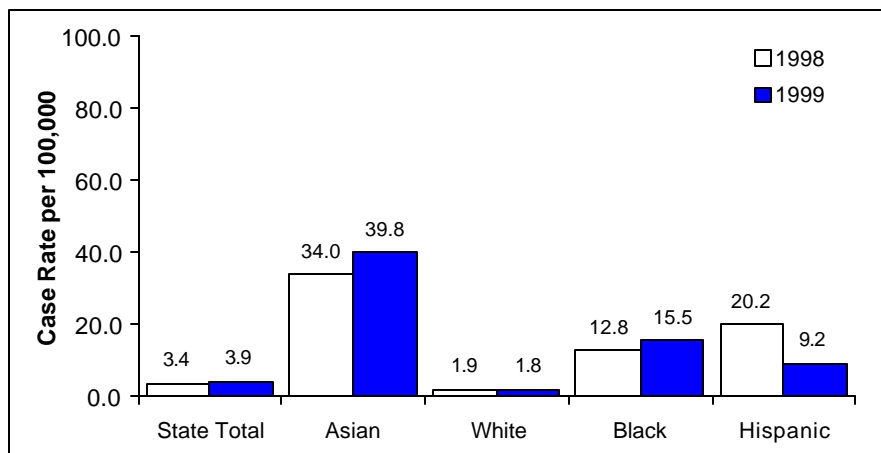


Figure 4. Tuberculosis case rates per 100,000 population by race/ethnicity, Missouri, 1998 and 1999.

Figure 4.) The number of tuberculosis cases occurring among foreign-born persons remained relatively the same from 38 (20.7%) in 1998 to 39 (18.8%) reported cases in 1999. Case rates among Asians, who are mostly foreign-born, are disproportionately higher than for other racial and ethnic groups.

The largest proportion of active disease cases, 169 cases (81.3%) were pulmonary compared to 39 cases (18.7%) which were extrapulmonary. Of the 39 extrapulmonary cases, the sites of disease were lymphatic (11), pleural (10), bone & joint (6), genitourinary (4), other (3), miliary (2), meningeal (2), and peritoneal (1). (See Figure 5.)

In 1999, three cases of multiple drug-resistant tuberculosis occurred. In addition, the single drug resistance rate

remained high at 5.3 percent. When the drug resistance rate exceeds four percent, initial use of four tuberculosis drugs is recommended for all active disease patients and suspects.

For the period of January through December 1999, there were a total of nine tuberculosis/AIDS cases. Of the nine cases of tuberculosis/AIDS, five were reported from St. Louis City, three from Kansas City and one from Springfield-Greene County. Eight of the nine cases were between the ages of 30-50 and one was 1-year of age. Eight of the nine cases were male and one was female.

In 1999, two active tuberculosis disease cases were reported in the state correctional system and the same number were reported in 1998. During 1999, a

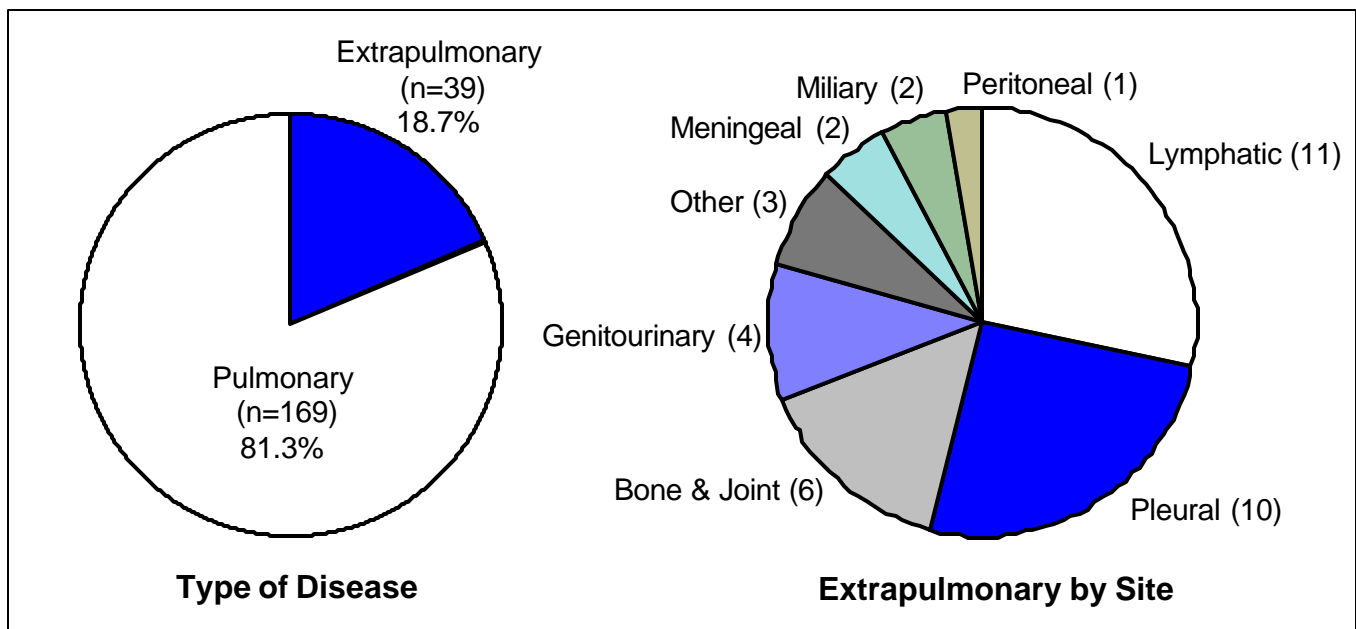


Figure 5. Reported tuberculosis cases by type of disease and site, Missouri, 1999.

total of 54,962 inmates were skin tested and read. There were 600 new positives in addition to the 5,019 who were previously positive. The overall positivity rate was 10.2 percent, and the positivity rate in previously unknown positives was 1.1 percent. All 600 positive inmates were started on treatment for tuberculosis infection. In 1999, a total of 474 inmates completed treatment for tuberculosis infection while in the correctional system.

The initial use of four tuberculosis medications is a priority for the Section of Vaccine-Preventable and Tuberculosis Disease Elimination in order to lower the drug resistance rate. All active tuberculosis disease patients, and all suspects, should be started on four medications from the beginning of treatment until drug susceptibility is determined. Those medications include isoniazid, rifampin, pyrazinamide and ethambutol or streptomycin. In 1996, only 67.9 percent of active disease patients were placed on the four-drug regimen. This improved to 75.0 percent in 1997, to 79.0 percent in 1998 and to 85.6 percent in 1999. However, much work remains in order to reach 100 percent compliance.

Directly observed therapy (DOT) has been adopted as the standard of care in Missouri. Our emphasis is on placing all active tuberculosis disease patients on DOT to ensure that treatment is completed. In areas where there are few active disease cases, steps should be taken to put patients with tuberculosis infection on directly observed treatment for infection (DOTI). These strategies include watching people swallow their pills. Our first priority is to motivate people to come to the local health department for DOT/DOTI. However, if this is not possible, we must go to the patient. Community volunteers can be recruited to assist the local health department in conducting DOTI. Volunteers may include friends, neigh-

bors, local ministers, retired persons, pharmacists, school nurses, staff in physician offices and other individuals. In 1996, 74.1 percent of active tuberculosis disease patients were placed on DOT. This improved to 75.0 percent in 1997 and to 80.0 percent in 1998 and 1999. However, additional efforts must be undertaken in order to reach our goal of 100 percent. This will require the commitment and creativity of all those involved.

Missouri's goal is to have no more than 175 new tuberculosis cases annually by the end of the year 2000, and to then eliminate tuberculosis in the state by the year 2010.

**Tuberculosis infection** means that the person has bacteria that cause tuberculosis in their body. They are not sick because the bacteria are inactive. They cannot spread the bacteria to others. A person with tuberculosis infection usually has a positive skin test, a normal chest x-ray and does not feel sick.

**Tuberculosis disease** means that the person is sick from bacteria that are actively reproducing in their body. Persons with pulmonary tuberculosis usually have a positive skin test, an abnormal chest x-ray and one or more of the symptoms of tuberculosis such as persistent cough, chest pain, feeling weak, weight loss, fever and/or night sweats. These people are often capable of giving the infection to others.

# 1999–2000 Influenza Summary

Mary E. Kliethermes, R.N., B.S.  
Section of Communicable Disease  
Control and Veterinary Public Health

## 1999–2000 Missouri Influenza Season

An early beginning marked the 1999–2000 Missouri influenza season. On October 12, 1999, a 13-year-old female was diagnosed by the influenza rapid-testing method at her physician's office in Greene County. The isolate was forwarded to the Missouri State Public Health Laboratory (SPHL) and identified by viral culture method as influenza A, subtype H3N2. The isolate was sent to the Centers for Disease Control and Prevention (CDC) laboratory where it was confirmed as influenza A/Sydney/05/97-like (H3N2). This type was similar to the influenza strain included in the vaccine for the 1999–2000 season. The last laboratory-confirmed case of influenza B was reported in week 13 and the last case of influenza A was reported in week 18.

There were 3,395 laboratory-confirmed cases of influenza reported in Missouri during the 1999–2000 season. Of the 3,395 confirmed cases, 2,409 (71%) were type A, with 72 subtyped as H3N2 and 4 subtyped as H1N1. There were 5 (0.002%) confirmed cases of type B influenza reported in Missouri. The remaining reported confirmed cases, 981 (29%), were detected by the influenza rapid-testing method, that did not distinguish type. The number of confirmed cases of influenza type A began increasing during week 48, the week of November 28 through December 4, and peaked during week 1, the week ending January 8, 2000. The number of cases returned to baseline levels by week 6. (See Figure 1.) Figure 2 shows laboratory-confirmed influenza cases by county of residence.

Missouri active surveillance sites reporting to local public health agencies submitted data showing a rise of influenza-like illness during week 49.

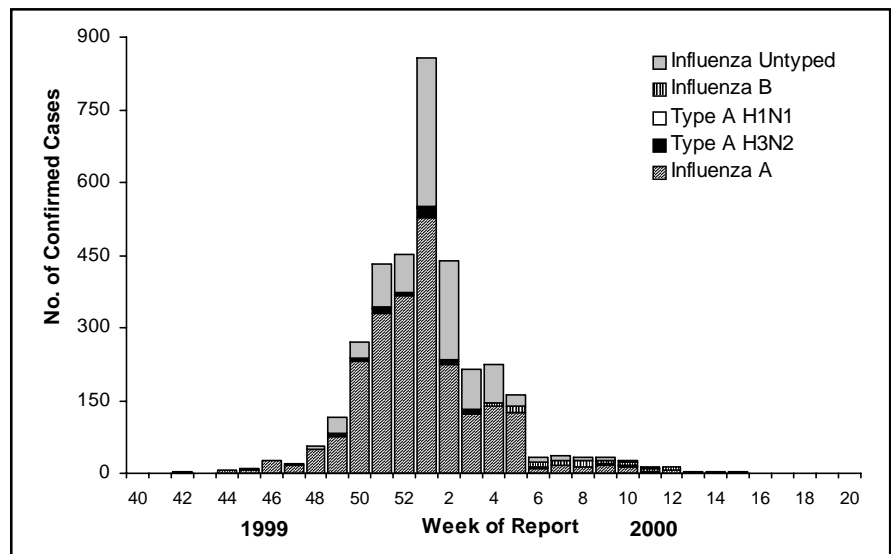


Figure 1. Laboratory-confirmed influenza cases by week of report, Missouri, 1999–2000 season.

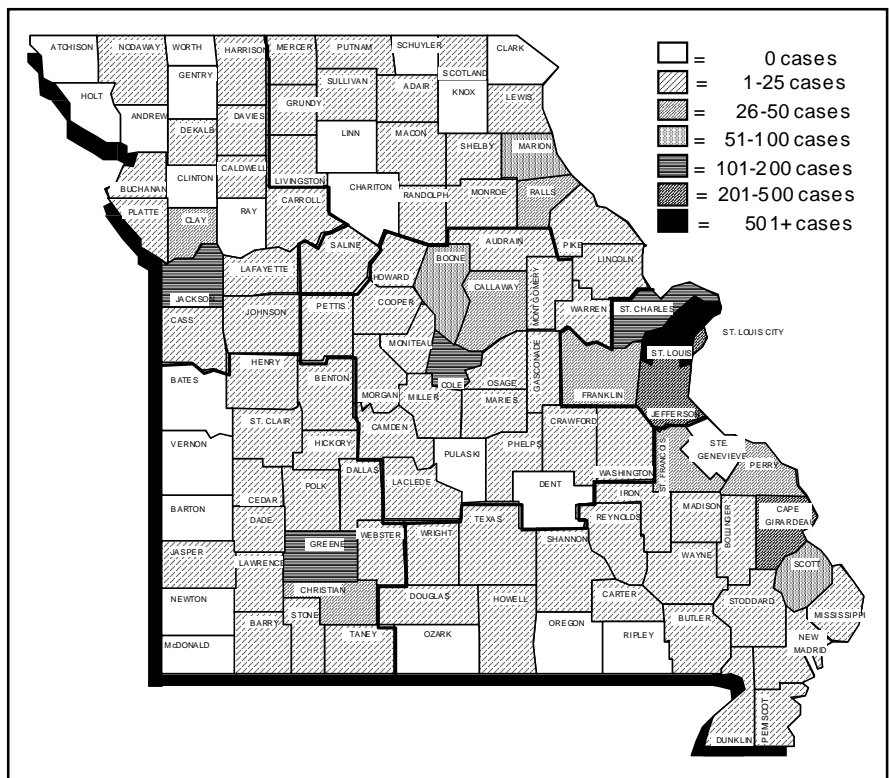


Figure 2. Laboratory-confirmed influenza cases by county of residence, Missouri, 1999–2000 season.

Reports of cases peaked during week 2 and gradually declined by week 14. The 1999–2000 influenza season is best demonstrated by the sharp rise of the

curve at week 2, with a sustained peak during weeks 2 through 4 and a gradual decline through the remaining influenza season. The curve rose above the 10-

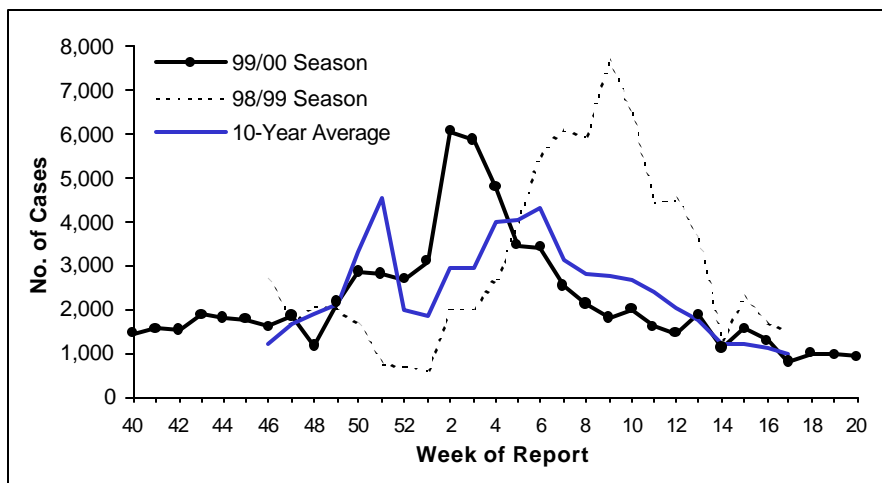


Figure 3. Influenza-like illness by week of report, Missouri, 1999/2000 season, 1998/1999 season and 10-year average\*.

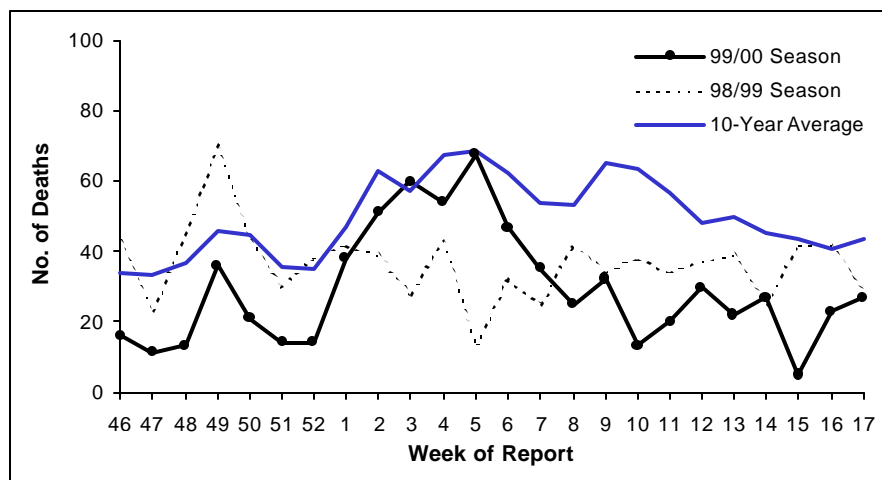


Figure 4. Pneumonia and influenza (P&I) deaths by week of report, Missouri, 1999/2000 season, 1998/1999 season and 10-year average\*.

year average\* at week 52 and remained above until week 5, and then later bounced above it during week 13 and again during weeks 15 and 16. (See Figure 3.) Data submitted to the CDC by the Missouri U.S. Influenza Sentinel Physicians show an irregular up and down pattern until week 49. At week 49, the curve rose, peaked at week 52, then gradually returned to baseline levels by week 4.

In Missouri, the number of pneumonia and influenza (P&I) deaths rose above the 10-year average\* during week 3.

\* The 10-year average is the summation for that week of the 10 prior influenza seasons (not including the present season) divided by 10.

The influenza season P&I mortality experience in Missouri appears to be much less than the prior 10 years, but greater than the 1998–1999 season. (See Figure 4.) Nationally, the percentage of P&I deaths exceeded threshold values for 33 of the 35 weeks as reported by the vital statistics offices of 122 United States cities. The proportion of deaths attributed to P&I peaked at 11.2 percent during week 3. During the previous influenza seasons, 1996–97, 1997–98 and 1998–99, the P&I mortality levels peaked between 8.8 and 9.1 percent. CDC cautions that the 1999–2000 P&I figures must be interpreted with caution because important changes have taken place in the case definition that may be

contributing to higher estimates of P&I mortality than in previous years. CDC's analysis of those changes may be referenced in the March 10, 2000, *Morbidity and Mortality Weekly Report* (MMWR), which can be accessed via the CDC web site at <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/mm4909a1.htm>.

From mid-December 1999 through January 2000, the Department of Health received nine reports of influenza-like illness outbreaks in long-term care facilities. Three of the nine outbreaks were confirmed as influenza A by the influenza rapid-testing method.

During January, seven schools cancelled classes up to four days because of increased absenteeism due to influenza-like illness in students, teachers, and school staff. One central Missouri county and one health care clinic in southeastern Missouri reported community outbreaks. The central Missouri community outbreak was confirmed by laboratory viral testing at the SPHL as influenza A/Sydney/05/97-like (H3N2).

## 2000–2001 Influenza Vaccine Recommendations

The Food and Drug Administration Vaccines and Related Biological Products Advisory Committee (VRBPAC) has recommended that the 2000–2001 trivalent influenza vaccine for the United States contain A/New Caledonia/20/99-like (H1N1), A/Moscow/10/99-like (H3N2), and B/Beijing/184/93-like antigens. For the A/Moscow/10/99-like (H3N2) antigen, United States manufacturers will use the antigenically equivalent A/Panama/2007/99 (H3N2) virus and for the B/Beijing/184/93-like antigen, they will use the antigenically equivalent B/Yamanashi/166/98 virus. These equivalent viruses will be used because of their growth properties and because they are representative of currently circulating A(H3N2) and B viruses. (Influenza vaccine recommendations for 2000–2001 can be found on pages 8–9 and 27 of this issue.)

# 2000–2001 Recommendations for the Use of Influenza Vaccine

Summaries of the current recommendations for influenza vaccines from the Advisory Committee on Immunization Practices (ACIP) follow. The recommendations were originally published in *Morbidity and Mortality Weekly Report (MMWR)* on April 14, 2000; 49(RR-3):1–38. Since that time, the Centers for Disease Control and Prevention (CDC) have reported that vaccine manufacturers are experiencing production problems. This situation will lead to a delay in distribution and possibly substantially fewer doses of vaccines than in 1999.

Many providers have been concerned about how to adjust their fall immunization activities in light of the delay and potential reduction in the production of vaccine. In response, the CDC published adjunct ACIP recommendations in *MMWR* July 14, 2000;49(27):619–622.

Summaries of the adjunct recommendations and original recommendations follow. The later, adjunct, recommendations are first. The complete text of the adjunct recommendations is available

through the CDC web site at <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/mm4927a4.htm>; the text of the original recommendations is at <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/rr4903a1.htm>

If you have questions regarding the recommendations, please contact the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313.

## Summary of Adjunct ACIP Recommendations Due to Delayed Vaccine Supply

1. Organized influenza vaccination campaigns should be delayed until early to mid-November. Influenza vaccine administered after mid-November can still provide substantial protective benefits. The purpose of this recommendation is to minimize cancellations of vaccine campaigns and wastage of vaccine doses resulting from delays in vaccine delivery.
2. Influenza vaccination of persons at high risk for complications from influenza and their close contacts should proceed routinely during regular health-care visits. Routine influenza vaccination activities in clinics, offices, hospitals, nursing homes, and other health-care settings (especially vaccination of persons at high risk for complications from influenza, health-care staff, and other persons in close contact with persons at high risk for complications from influenza) should proceed as normal.
3. Provider-specific contingency plans for an influenza vaccine shortage should be developed in order to maximize vaccination of high-risk persons and health-care workers in the event that there is a vaccine shortage.

4. In 2000, ACIP broadened its influenza vaccine recommendations to include all persons aged 50–64 years. If there is a vaccine shortage, it would be appropriate to focus primarily on vaccinating persons with high-risk conditions rather than this entire age group.

Minimizing wastage of influenza vaccine is important. In order to minimize the amount of vaccine that is returned to a manufacturer and discarded, influenza vaccine purchasers should refrain from placing duplicate orders with multiple companies. Options to promote redistribution of vaccine that otherwise would be returned or discarded are being developed.

As new information becomes available, CDC and the Food and Drug Administration (FDA) will issue updates.

## Primary Changes in the 2000–2001 Recommendations

The updated recommendations include five principal changes from the 1999–2000 recommendations:

- The age for universal vaccination has been lowered to 50 years from 65 years.
- Scheduling of large, organized vaccination campaigns after mid-October should be considered because the availability of vaccine cannot be assured consistently in the early fall.
- The 2000–2001 trivalent vaccine virus strains are A/Moscow/10/99 (H3N2)-like, A/New Caledonia/20/99 (H1N1)-like, and B/Beijing/184/93-like strains.
- Information on neuraminidase-inhibitor antiviral drugs has been added.
- A list of other influenza-related infection control documents for special populations has been added.

## Influenza

For those of you wishing to bookmark an Internet site for the most current influenza information from the Centers for Disease Control and Prevention (CDC), try:

<http://www.cdc.gov/ncidod/diseases/fluvirus.htm>

This site includes the most recent CDC surveillance reports and information on antivirals for influenza A, vaccine recommendations, international trends, etc.

The Food and Drug Administration's Vaccines and Related Biologic Products Advisory Committee (VRBPAC) recommends that the trivalent influenza vaccine prepared for the 2000–2001 season will include A/Moscow/10/99 (H3N2)-like, A/New Caledonia/20/99 (H1N1)-like, and B/Beijing/184/93-like antigens. For the A/Moscow/10/99 (H3N2)-like antigen, United States manufacturers will use the antigenically equivalent A/Panama/2007/99 (H3N2) virus and for the B/Beijing/184/93-like antigen, they will use the antigenically equivalent B/Yamanashi/166/98 virus.

Influenza vaccine is strongly recommended for any person aged 6 months or older who—because of age or underlying medical condition—is at increased risk for complications of influenza. In addition, health-care workers and others (including household members) in close contact with persons in high-risk groups should be vaccinated to decrease the risk of transmitting infection to persons at high risk.

#### **Persons at High Risk for Influenza-Related Complications**

Vaccination is recommended for the following groups of persons who are at increased risk for complications from influenza:

- persons aged >50 years;
- residents of nursing homes and other chronic-care facilities that house persons of any age who have chronic medical conditions;
- adults and children who have had chronic disorders of the pulmonary or cardiovascular systems, including asthma;
- adults and children who have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications

or by human immunodeficiency virus);

- children and teenagers (aged 6 months to 18 years) who are receiving long-term aspirin therapy and, therefore, might be at risk for developing Reye's syndrome after influenza infection; and
- women who will be in the second or third trimester of pregnancy during the influenza season.

#### **Persons Who Can Transmit Influenza to Those at High Risk**

Persons who are clinically or subclinically infected can transmit influenza virus to persons at high risk for complications from influenza. Efforts to protect members of high-risk groups against influenza might be improved by reducing the likelihood of influenza exposure from their care givers. Therefore, the following groups should be vaccinated:

- physicians, nurses, and other personnel in both hospital and outpatient-care settings;
- employees of nursing homes and chronic-care facilities who have contact with patients or residents;
- employees of assisted living and other residences for persons in high-risk groups;
- persons who provide home care to persons in high-risk groups; and
- household members (including children) of persons in high-risk groups.

#### **Persons Infected with Human Immunodeficiency Virus**

Limited information exists regarding the frequency and severity of influenza illness or the benefits of influenza vaccination among persons with human immunodeficiency virus (HIV) infection. However, reports suggest that influenza symptoms might be prolonged and the risk for complications from

influenza increased for some HIV-infected persons.

#### **Breastfeeding Mothers**

Influenza vaccine does not affect the safety of mothers who are breastfeeding or of their infants. Breastfeeding does not adversely affect immune response and is not a contraindication for vaccination.

#### **Travelers**

Persons at high risk for complications of influenza should consider receiving influenza vaccine before travel if they were not vaccinated with influenza vaccine during the preceding fall or winter and they plan to a) travel to the tropics; b) travel with large organized tourist groups at any time of year; or c) travel to the Southern Hemisphere from April through September. Persons at high risk who received the previous season's vaccine before travel should be revaccinated with the current vaccine in the following fall or winter.

#### **General Population**

Physicians should administer influenza vaccine to any person who wishes to reduce the likelihood of becoming ill with influenza (the vaccine can be administered to children as young as 6 months). Persons who provide essential community services should be considered for vaccination to minimize disruption of essential activities during influenza outbreaks. Students or other persons in institutional settings (e.g., those who reside in dormitories) should be encouraged to receive vaccine to minimize the disruption of routine activities during epidemics.

#### **Persons Who Should Not Be Vaccinated**

Inactivated influenza vaccine should not be administered to persons known to have anaphylactic hypersensitivity to eggs or to other components of the influenza vaccine without first consulting  
(continued on page 27)

# Tularemia Exposure Through Specimen Handling

Sandy Hanauer

Missouri State Public Health Laboratory

*Francisella tularensis* is an organism that is highly virulent for most mammals. Each year, Missouri is consistently among the top three states (along with Arkansas and Oklahoma) with respect to the number of cases reported nationwide. In recent years, most of these cases were probably caused by tick bites. Recently, the Missouri State Public Health Laboratory (SPHL) has seen an increase in the number of referred cultures that have been identified as *F. tularensis*. Of the seven isolates received by the SPHL since June 1 of this year, only **two** submitting laboratories suspected tularemia and followed proper handling procedures. When a clinical laboratory does not suspect tularemia and does not observe proper precautions, multiple exposures among laboratory staff may occur. This results in the need for precautionary prophylaxis of any exposed or potentially exposed laboratory workers.

When **processing clinical specimens** suspected of containing tularemia, strict Biosafety Level 2 precautions must be observed (open bench as long as splashing or aerosol production potential is low, along with gloves, gowns, face-shields, etc.). Because *F. tularensis* is so highly infectious (the human infective dose is less than 10 organisms via the respiratory route), it is important that, once an organism suspected of being *F. tularensis* is isolated, **Biosafety Level 3** precautions are observed (same precautions as Biosafety Level 2, but working **completely** within a certified biological safety cabinet). It is also important that physicians suspecting a patient of having tularemia alert the laboratory, because of the danger to laboratory personnel who will process these clinical specimens. Physicians who obtain clinical specimens in their offices (such as aspirates from lymph nodes or scrapings from ulcers) should also be aware of potential exposure.

## Tularemia, In Summary:

- ✓ The Missouri State Public Health Laboratory (SPHL) has seen an increase in *F. tularensis* isolates over the past month.
- ✓ Of the last seven isolates received in the SPHL, five of the submitting laboratories (and one physician's office) **did not know** they were dealing with tularemia and multiple exposures among technicians resulted. If organisms meeting the description of *F. tularensis* or suspected of being *F. tularensis* are encountered in a clinical laboratory, they should be forwarded immediately to the SPHL.
- ✓ Laboratory and other health care professionals exposed to *F. tularensis* should be prophylaxed with antibiotics to prevent infection with this highly infectious organism.
- ✓ It is not necessary to perform antimicrobial susceptibilities for isolates of *F. tularensis*.
- ✓ The drug of choice for *F. tularensis* infections is Streptomycin (cure rate 97%), followed by Gentamycin (86%), Tetracycline (88%), Chloramphenicol (77%) and others. Ceftriaxone is ineffective.
- ✓ Tetracycline (which is bacteriostatic) is effective as a prophylactic after laboratory exposure, when continued for 14 days.

If you have any questions, please call the Missouri State Public Health Laboratory at (573) 751-0633.

The following characteristics, when observed, should serve to alert laboratory technicians to the possibility of tularemia:

1. The **very** small size of *F. tularensis* on gram staining should be an immediate warning to microbiologists. Tularemia is a tiny, gram-negative coccobacillus; it is sometimes difficult to observe the actual morphology of individual organisms because they are so small.
2. *F. tularensis* is oxidase negative. **Any tiny, gram-negative, oxidase-negative organism should be suspected of being tularemia.**  
NOTE: Because *Brucella* species are also very small, gram-negative and

highly contagious, oxidase-positive organisms fitting this description should also be handled at a Biosafety Level 3 until *Brucella* is ruled out.

3. *F. tularensis* usually requires cystine or cysteine to grow. It is very fastidious and may be slow-growing on initial isolation. It can be isolated on chocolate agar enriched with Isovitalex or selective medium for the isolation of *N. gonorrhoeae*, such as Thayer-Martin or Martin-Lewis media. There are less fastidious strains of *F. tularensis* that will grow on sheep agar. Tularemia will not grow on MacConkey agar and is almost entirely biochemically inert.

SPHL is fully equipped and capable of handling isolates suspected of being *F. tularensis*. The special bacteriology technicians who handle this organism have many years of experience in recognizing and identifying *F. tularensis* and have been immunoprophylaxed by vaccination. The SPHL offers a direct fluorescent antibody (DFA) test for which results can be reported back to submitting laboratories within a few hours of receipt of the specimen, as well as a slide agglutination test. If a smaller laboratory does not have the capability

to culture for *F. tularensis*, tissue (such as lymph node or lung biopsies) may be accepted at SPHL for processing **after prior consultation with SPHL**.


Because of the high number of cases of tularemia seen in Missouri each year, and because of the many different types of clinical samples which may yield tularemia, SPHL recommends that **very little manual manipulation** be done with a suspect culture (that is, one meeting the above criteria). Such organisms can be forwarded **immedi-**


**ately** to the SPHL for confirmation or identification.


If you have questions about specimen submission, please contact the Missouri State Public Health Laboratory at (573) 751-0633.


The Missouri State Public Health Laboratory has developed a web page describing its services. The web page can be accessed through the Department of Health web site at <http://www.health.state.mo.us>.


## LATE BREAKERS

 The Missouri Department of Health and the Missouri Nutrition Network are pleased to introduce the "Eat for Health" campaign to shape healthy eating habits among Missourians with limited resources. The "Eat for Health" campaign materials are available on the Department of Health web site at <http://www.health.state.mo.us/nutritionservices/eatforhealth.html#mnnf>. For more information, contact the Missouri Department of Health, Bureau of Nutrition Policy and Education, Missouri Nutrition Network at (573) 751-6183.

 This is the fourth year that the Missouri Department of Health will participate in the Centers for Disease Control and Prevention (CDC) influenza surveillance project called the U.S. Influenza Sentinel Physicians Surveillance Network. The program is designed as an active surveillance system to provide CDC with current national influenza-like illness information during the influenza season. The 2000–2001 influenza surveillance season begins the week ending October 1, 2000, and goes through the week ending May 19, 2001. If you are interested in participating in or would like more information about the U.S. Sentinel Physicians Surveillance Network, please contact the Section of Communicable Disease Control and Veterinary Public Health at (800) 392-0272.

 Over 2,000 health professionals in many areas of specialty met in Atlanta in mid-July for the **International Conference on Emerging Infectious Diseases (ICEID)**. Major topics included current work on surveillance, epidemiology, research, communication and training, bioterrorism, and prevention and control of emerging infectious diseases, both in the United States and abroad. Selected presentations from the ICEID conference are available online at: [http://www.cdc.gov/iceid/webcast/promo\\_webcast.htm](http://www.cdc.gov/iceid/webcast/promo_webcast.htm). Many presentations include both audio and slides. Some are also available as downloadable Microsoft PowerPoint presentations. In addition, the proceedings of the ICEID Conference will be published (electronically and in print) in an upcoming special issue of the **Emerging Infectious Diseases Journal**. (This journal is available online at: <http://www.cdc.gov/ncidod/eid/>.)

 **A Guide to the Clinical Care of Women With HIV: 2000 Preliminary Edition** is available online from the Health Resources and Services Administration (HRSA) at: <http://hab.hrsa.gov/womencare.htm>. This 480 page document is described as the first comprehensive clinical manual on this topic, and is designed for physicians and other medical professionals caring for women living with HIV/AIDS.

 Current **HIV Treatment Guidelines** are available online from the HIV/AIDS Treatment Information Service (ATIS) at: <http://hivatis.org/trtgdlns.html>. Included here are:

- Adult and Adolescent Guidelines
  - Pediatric Guidelines
  - Perinatal Guidelines
  - Health-Care Worker Exposure Guidelines
  - Nonoccupational Exposure Considerations
  - Opportunistic Infections Guidelines
  - Tuberculosis Guidelines
- (ATIS is a U.S. Department of Health and Human Services [DHHS] project.)

Also available from ATIS is **HIV and Its Treatment: What You Should Know**, a consumer brochure that provides information from the HIV treatment guidelines developed by the DHHS and uses a question and answer format to make the information easier to understand by people without a technical background. It also includes a section on adherence to treatment plans. This document is available in PDF format at: <http://hivatis.org/publications/consumerbrochure599.pdf>. Hard copies are also available: call 1-800-448-0440 for a free single copy.

# Vaccine-Preventable Disease 1999 Annual Report

Susan Denny

Section of Vaccine-Preventable and Tuberculosis Disease Elimination

The development of immunizations to protect against life-threatening diseases is arguably the most important medical development of the twentieth century.<sup>1</sup> As a result of widespread vaccination of children, there have been dramatic decreases in morbidity and mortality due to vaccine-preventable diseases in the United States.

As the incidence of most vaccine-preventable diseases in Missouri has continued to decline, efforts to collect complete and accurate information on remaining cases become increasingly important. By having accurate information on disease incidence, health care workers can better ensure that vaccines are widely distributed in order to prevent, control and eliminate vaccine-preventable diseases.

"The reason for collecting, analyzing, and disseminating information on a disease is to control that disease."<sup>2</sup> By analyzing information obtained on these cases, it will be possible to gain a better understanding of the factors that allow disease transmission despite high immunization rates.

"The occurrence of vaccine-preventable diseases in a community may be a sentinel event that signals the presence of an un- or underimmunized population within the community. Such populations may be small, access health care infrequently, or otherwise be difficult to identify."<sup>3</sup>

The Section of Vaccine-Preventable and Tuberculosis Disease Elimination is responsible for surveillance of pertussis, diphtheria, tetanus, measles, mumps, poliomyelitis and rubella, as well as *Haemophilus influenzae* type b in children under age 15. Surveillance of three other vaccine-preventable

diseases, hepatitis A, hepatitis B and *Haemophilus influenzae* type b in adults, is conducted by the Section of Communicable Disease Control and Veterinary Public Health. (Information on the incidence of these diseases can be found in the Section of Communicable Disease Control and Veterinary Public Health 1999 Annual Report scheduled for publication in the September–October 2000 issue of this newsletter.)

In 1999, no cases of diphtheria or polio were reported in Missouri. There was one case of mumps in an 11-year-old female who had received two immunizations. There were two cases of rubella, both in adult males.

There was one case of tetanus in a 62-year-old female. "Tetanus is not a communicable disease, and the causative organism is ubiquitous in the environment; unlike other vaccine-preventable diseases, there is no herd immunity for tetanus."<sup>3</sup> As long as any person remains susceptible, or any child is born to a susceptible woman, cases of tetanus can continue to occur. Preventing these cases continues to be extremely difficult.

In 1999, 75 cases of pertussis were reported in Missouri, compared to 59 cases in 1998. Fifty-six cases were in children less than 1 year of age, seven cases were in children between the ages of 1 and 5, and the remaining 12 cases were in persons over age 5.

Incomplete immunization coverage is not the only reason that cases of pertussis continue to occur. The Advisory Committee on Immunization Practices (ACIP) recommends an optimum of five doses of pertussis vaccine for children through age 6. But even if a person is fully immunized by age 7, immunity eventually wanes. However, it is not recommended that persons 7 years or older receive routine pertussis vaccination because adverse reactions to the vaccine are thought to be more

frequent, and pertussis-associated morbidity and mortality decrease with age.

The Department of Health is working with both public and private health care providers to achieve the goal of appropriately immunizing 90 percent of Missouri's 2-year-olds. As the department works toward this goal, good surveillance data will greatly enhance its ability to identify individuals and communities in which immunization rates need to be improved.

## REFERENCES:

1. Ten great public health achievements—United States, 1900–1999. *MMWR* 1999; 48(50):1141.
2. Foege WH, Hogan RC, Newton LH. Surveillance projects for selected diseases. *Int J Epidemiol* 1976;5:29–37.
3. Wharton M. Disease Reduction Goals. Manual for the Surveillance of Vaccine-Preventable Disease. Atlanta, Ga: National Immunization Program, Centers for Disease Control and Prevention, 1997:1–5.

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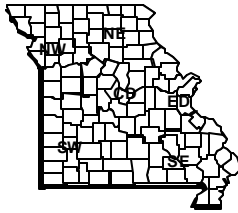
## Syphilis Elimination

(continued from page 2)

- Prevent the transmission of syphilis from a past or present infected pregnant female partner to her unborn child.<sup>3</sup>

## REFERENCES:

1. Centers for Disease Control and Prevention. The National Plan to Eliminate Syphilis from the United States, October 1999.
2. Kansas City, Missouri, Health Department. STD Examiner. July–September 1994;1(3).
3. Washington State Department of Health. Partner and Spousal Notification, Questions and Answers for Providers, August 1997.



Missouri Department of Health  
Division of Environmental Health and Communicable Disease Prevention  
**QUARTERLY DISEASE OCCURRENCE**  
**BY REGION AND TIME PERIOD**

Reporting Period\*  
**April - June 2000**

Districts											3 Month State Totals		Cumulative January-June		
CD	** ED	NE	** NW	SE	** SW	*** OTHER	Kansas City	St. Louis City	St. Louis Co.	Spfd. Greene Co.	2000	1999	For 2000	For 1999	5 YR MEDIAN

<b>Vaccine Preventable</b>																
Influenza	1	0	0	2	1	0	1	1	11	9	0	26	206	2414	935	302
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mumps	0	0	0	0	0	0	0	0	1	0	0	1	0	2	1	2
Pertussis	3	0	1	6	2	2	1	0	0	1	1	17	16	22	27	17
<b>Viral Hepatitis</b>																
A	5	0	1	6	2	20	1	9	41	8	2	95	94	248	217	511
B	23	19	5	24	12	14	11	42	94	69	7	320	42	373	81	152
C	0	2	1	0	0	1	1	0	1	0	2	8	2	16	2	na
Non-A Non-B	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Meningitis</b>																
Meningococcal Disease	0	0	0	0	3	0	1	0	0	4	0	8	9	17	26	26
Meningococcal Other	1	0	1	0	1	1	2	1	5	5	1	18	16	34	26	26
<b>Enteric Infections</b>																
Campylobacter	25	15	8	6	15	31	1	10	15	25	16	167	172	249	255	255
E. Coli O157:H7	2	0	1	1	4	2	0	0	0	3	0	13	11	35	13	13
Salmonella	33	29	13	31	21	30	2	15	20	25	8	227	227	313	310	240
Shigella	19	5	0	23	32	8	4	69	47	30	1	238	282	343	396	225
<b>Parasitic Infections</b>																
Cryptosporidiosis	1	0	0	0	0	0	0	0	1	1	0	3	2	8	7	na
Giardiasis	24	10	2	7	4	15	3	6	45	32	1	149	182	315	296	286
<b>Respiratory Diseases</b>																
Legionellosis	0	0	0	1	1	1	0	2	0	4	2	11	7	13	11	8
<b>Sexually Transmitted</b>																
AIDS	8	3	1	4	11	5	3	19	50	15	7	126	117	226	196	117
HIV Infection	7	4	1	5	8	6	3	29	31	11	5	110	135	180	223	n/a
Chlamydia	270	117	86	156	213	187		865	641	623	119	3277	3458	6638	6959	2938
Gonorrhea	90	27	13	28	88	33		617	720	397	52	2065	4152	4021	3550	2151
P & S syphilis	1	0	0	0	0	0		0	4	1	0	6	57	21	50	29
<b>Tuberculosis</b>																
TB Disease	5	0	0	2	5	1	0	10	11	7	2	43	43	84	81	n/a
TB Infections	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Zoonotic</b>																
Ehrlichiosis	1	1	0	1	3	1	0	1	1	4	0	13	2	13	2	0
Lyme Disease	4	3	2	1	5	0	1	0	0	1	0	17	24	21	29	20
Rabies (Animal)	2	0	0	4	1	2	0	0	2	2	0	13	8	15	14	14
Rocky Mountain Spotted Fever	2	1	0	0	3	6	4	1	0	3	0	20	6	20	6	6
Tularemia	2	1	0	1	3	2	0	0	1	0	1	11	6	13	6	5
<b>STATEWIDE TOTALS FOR APRIL-JUNE 2000</b>																
<b>No. of Outbreaks by Disease Agent</b>																
		<b>Vaccine Preventable Diseases</b>							<b>Other Reportable Diseases</b>							
Disease Group		#														
AGI		1							Hib Meningitis - 4							
ARI		1							Brucellosis							
Chickenpox		1							Kawasaki Disease							
C difficile		1							Leprosy							
Salmonella		1							Listeria							
Scabies		3							Psittacosis							
									Streptococcal Disease,							
									Invasive, Grp A							
									15							

\*Reporting Period Beginning April 2, 2000 and Ending July 1, 2000.

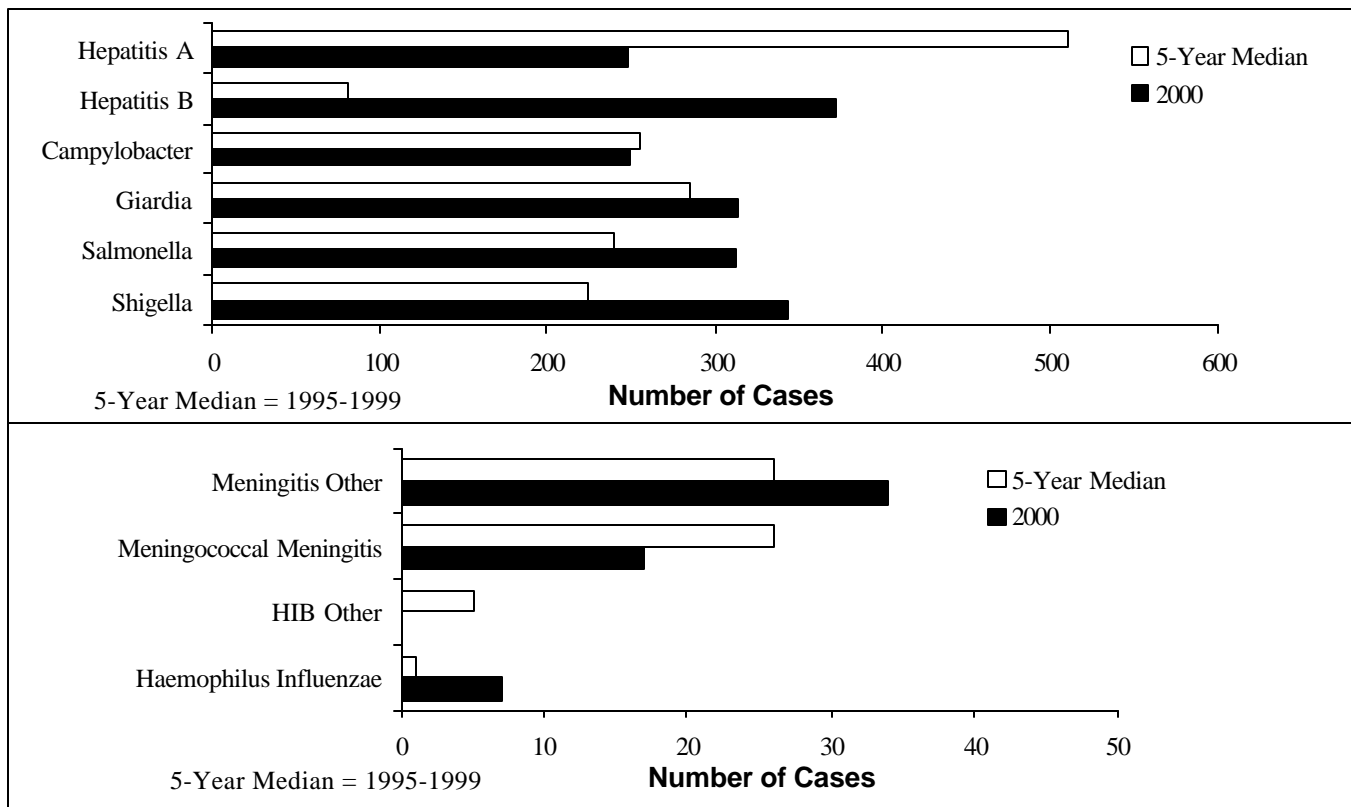
\*\*Totals do not include Kansas City, St. Louis City, St. Louis County, or Springfield

\*\*\*State and Federal Institutions and Unknown

n/a Data unavailable

Due to data editing, totals may change.

## Disease Reports, January–June 2000 and 5-Year Median



### Influenza

From January–June, 2000, 2,414 confirmed influenza cases were reported; with 935 cases reported for the same period in 1999. This is a 699.3% increase from the five-year median for January–June of 302 cases. All health districts showed an increase in influenza cases. We believe patient and physician acceptance and availability of the new rapid testing methods was high, accounting for the increase in laboratory-confirmed cases.

### Viral Hepatitis

From January–June, 2000, 248 hepatitis A cases were reported; with 217 cases reported for the same period in 1999. This is a 51.5% decrease from the five-year median for January–June of 511 cases. The majority of the cases are being reported from the Eastern Health District as the result of a community outbreak.

Hepatitis B increased to 373 cases in 2000 from 81 cases in 1999 for the six-month period and is a 145.4% increase from the five-year median for January–June of 152 cases. The majority of the cases are being reported from the Eastern Health District. The Section of Communicable Disease Control and Veterinary Public Health is investigating this increase. It is suspected this may be an artifact of reporting.

### Enterics

Campylobacter decreased slightly (2.4%) during this time period to 249 cases in 2000 from 255 cases in 1999. The five-year median for campylobacter is also 255 cases. Salmonella increased slightly to 313 cases in 2000 from 310 cases in 1999. This is an increase of 30.4% over the five-year median of 240 cases. Shigellosis decreased to 343 cases in 2000 from 396 cases in 1999. This is an increase of 52.4% from the five-year median of 225 cases. The majority of the shigellosis cases are being reported from the Northwestern Health District as a result of a community outbreak.

### Parasites

Giardiasis increased slightly, to 315 cases in 2000 from 296 cases in 1999 for the January–June time period. This is a 10.1% increase from the five-year median of 286 cases.

### Meningitis

Meningococcal meningitis decreased for this period with 17 cases in 2000 from 26 cases in 1999. This is a decrease of 34.6% from the five-year median which is also 26 cases. Meningitis other increased from 26 cases in 1999 to 34 cases in 2000. This is a 30.8% increase from the five-year median of 26.

### HIB Disease

Seven cases of *Haemophilus influenzae* were reported for this time period compared to 3 cases in 1999. This is an increase of 600.0% from the five-year median of 1. No cases of HIB other were reported in 2000 or 1999 for this time period. The five-year median is 5 cases of HIB other.

# Dr. Eduardo Simoes Named as State Epidemiologist

The Missouri Department of Health has named Eduardo Simoes, M.D., M.Sc., M.P.H., as chief of the Office of Epidemiology and State Epidemiologist effective June 1, 2000.

The State Epidemiologist and Office of Epidemiology staff provide leadership and assist other sectors of the Missouri Department of Health in investigating and evaluating public health issues leading to the development of appropriate policies and/or interventions based on the findings. The office works with division and bureau administrators to develop projects that assist in clarifying various health-related issues and in guiding policy development. The office also provides consultation to local public health agencies and participates in training courses and presentations regarding various aspects of epidemiology and surveillance.

Dr. Eduardo Simoes has been a chronic disease medical epidemiologist in the Department of Health's Office of Surveillance, Research and Evaluation

since 1995. In that position, he was responsible for developing and overseeing surveillance and evaluation activities for chronic disease, cancer and the Behavioral Risk Factor Surveillance System. Simoes also serves as Adjunct Assistant Professor for the University of Missouri-Columbia's School of Medicine and Assistant Professor in Community Health for St. Louis University's School of Public Health.

Dr. Simoes began his medical career as a general practitioner in Recife, Brazil, in 1982, and since then has served in numerous health-related management, planning and research positions in Brazil and in the United States. He brings to the position extensive experience with management and analysis of national and statewide surveillance data, strong analytical skills in epidemiology and biostatistics, and experience with epidemiological surveillance development, analysis and translation. In addition to his doctor in medicine degree from Brazil, he holds a master of science



in community health for developing countries and a postgraduate diploma in community health from the London School of Hygiene and Tropical Medicine at the University of London, England and a master of public health and master of science in epidemiology from Emory University, Atlanta, Georgia.

Dr. Simoes plans to provide leadership to the department in developing a more evidenced-based approach to public health issues.

## Local Public Health Agency Web Sites

Several local public health agencies in Missouri have developed web sites. We have listed below those that we are aware of. We will publish additional web sites as they come to our attention. We encourage you to take time to visit your county's web site to find out what your local public agency has to offer.

- ☞ Clay County Health Center at <http://www.clayhealth.com>
- ☞ Columbia/Boone County Health Department at <http://www.ci.columbia.mo.us/dept/health/index.htm>
- ☞ Jackson County Health Department at <http://www.trumed.org/departments/jchcd/JCHealthDepartment.html> (Connected to Truman Medical Center East)
- ☞ Kansas City Health Department at <http://www.kcmo.org/index.htm> (Select Health under the Departments category)
- ☞ Phelps/Maries County Health Department at <http://www.rollanet.org/~rutzmph/>
- ☞ Platte County Health Department at <http://plattecountyhealthdepartment.com>
- ☞ Ripley County Public Health Center at <http://www.ripleycountyhealth.com>
- ☞ St. Louis City Department of Health at <http://stlouis.missouri.org/citygov/health/>
- ☞ Vernon County Health Department at <http://www.vernoncohealthdept.com>

# Dr. Denny Donnell Retires as State Epidemiologist

Dr. Denny Donnell retired as State Epidemiologist after serving in that position for 28 years, but he left a legacy of accomplishments. As state epidemiologist, he was responsible for epidemiological investigations and using data in policy making, building programs, and administratively supporting many different bureaus and sections. Dr. Donnell also provided expert medical advice and consultation to health professionals within the department as well as from other agencies, states and universities, often through his participation in numerous advisory committees and work groups.

Dr. Donnell served as managing editor of the *Missouri Epidemiologist* newsletter, and felt that its creation was one of his most meaningful accomplishments during his tenure with the Department of Health. The newsletter is distributed to over 11,500 nurses, physicians, veterinarians, hospital infection control staff and public health officials and is also available in electronic format on the department's web site at <http://www.health.state.mo.us/MoEpi/MoEpi.html>. It serves as a resource point for information about current policies, practices and disease updates.

Dr. Denny Donnell saw many changes during his career in preventive medicine. He was there when the oral polio vaccine was first administered in 1962 and for the first measles vaccine in 1963. He was there when all of Missouri's disease surveillance was kept in one huge ledger book, tabulated and then sent by telegram to the Centers for Disease Control and Prevention every week. He was there when Swine flu was a concern, the dioxin problem surfaced and AIDS first threatened lives.

During his career, Dr. Donnell saw the emergence of many new diseases and the reduction of many others. New diseases such as AIDS, hepatitis C, chlamydia, giardiasis, Legionnaires

disease and Lyme disease, became evident. He saw new vaccines developed, as well as improvements to vaccines, such as *Haemophilus influenzae*, hepatitis, MMR, pneumococcal, chickenpox and pertussis. He also saw the reduction of many diseases such as gonorrhea, *Haemophilus influenzae* type b meningitis, malaria, measles, polio, rubella, syphilis, tetanus, tuberculosis and typhoid fever, plus the elimination of smallpox.

Since first deciding to specialize in preventive medicine when he joined the Army, accepting a teaching position with the University of Missouri-Columbia and then joining the Department of Health, Dr. Donnell served as a leader in the study and prevention of diseases. Dr. Donnell taught epidemiology at the University of Missouri-Columbia where he was instrumental in helping to develop a Masters of Science in Public Health program. He was a member of the Council of State and Territorial Epidemiologists.

While Dr. Donnell supervised the communicable disease control programs, he was instrumental in building up the staff and getting communicable disease coordinators placed in the districts. Before then county nurses had to handle all outbreak investigations.

Dr. Donnell believes a dramatic change occurred when the Department of Health achieved cabinet status and moved from a division to a department. This move gave the department more visibility and power to affect improvements in the health of Missourians.

One of Dr. Donnell's career-long goals is now becoming a reality—the linking of public health agencies into one network. His goal many years ago was to get all of the information from the bulky program manuals in three-ring binders onto a computer network. He knew how important it is for public

health staff in the local agencies to have the most up-to-date information at their fingertips. This is now becoming a reality through the Internet and MOHSAIC (Missouri Health Strategic Architecture and Information Cooperative), MICA (Missouri Information for Community Assessment), and MOHSIS (Missouri Health Surveillance Information System).

One of Dr. Donnell's long-range visions is a time when all diseases and conditions will be subjected to epidemiological analysis. At this time the department receives disease surveillance from death certificates and hospital discharge records, but these additional data would help develop much better recommendations.

Upon retirement Dr. Donnell will remain active in the American Lung Association, Missouri Public Health Association and Emerging Infections of the Central States. However, now he will have more time for his many hobbies, including antique collecting, writing poetry, reading, and watching birds.

## Disease Reporting

Cases of reportable diseases and conditions should be reported promptly to your local health department, or to the Missouri Department of Health at

**(800) 392-0272**  
(during working hours).

The emergency number is  
**(573) 751-4674**  
(for after hours, weekends or holidays).

# Summary of HIV/AIDS in Missouri, 1999

Robert Hamm, M.D., M.P.H.  
Office of Epidemiology

Kurt Kleier  
Joann Feltrop  
Linda Bell  
Office of Surveillance

## General Overview of HIV Disease in Missouri

Since 1982, 12,470 HIV-infected Missouri residents (4,139 HIV cases<sup>1</sup> and 8,331 AIDS cases) have been reported to the Missouri Department of Health (MDOH). In 1999, 411 HIV cases and 438 AIDS cases were reported.

Improved antiretroviral therapies have slowed the progress of HIV disease in many infected persons, an achievement reflected in the large decrease in reported AIDS cases from 1996 to 1997 (see Figure 1), and in AIDS-related deaths from 1995 to 1997 (see Figure 2). However, after 1997, these substantial downward trends did not continue. From 1998 to 1999, the number of reported AIDS cases decreased by only 6.4 percent, and the number of AIDS-related deaths, based on provisional data, actually appears to have increased by 2.8 percent. These newer trends likely reflect the limitations associated with current treatment regimens.

Males continue to make up the largest proportion of reported HIV and AIDS cases (83.9% of reported HIV cases and 91.0% of reported AIDS cases). (See Table 1.) However, as described below, certain populations of females appear to be increasingly affected by HIV.

African Americans continue to be disproportionately affected by HIV disease and, significantly, in 1999 for the first time in Missouri, more HIV and AIDS cases were reported in African Americans than in whites. (See Table 2 on page 18.) The rate per 100,000 population for HIV cases reported in

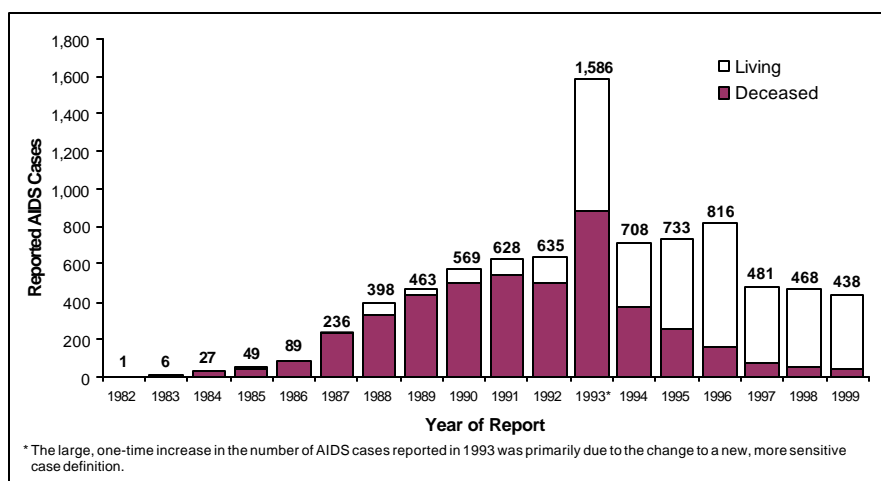


Figure 1. Persons diagnosed with AIDS (living and deceased) by year of report, Missouri, 1982-1999.

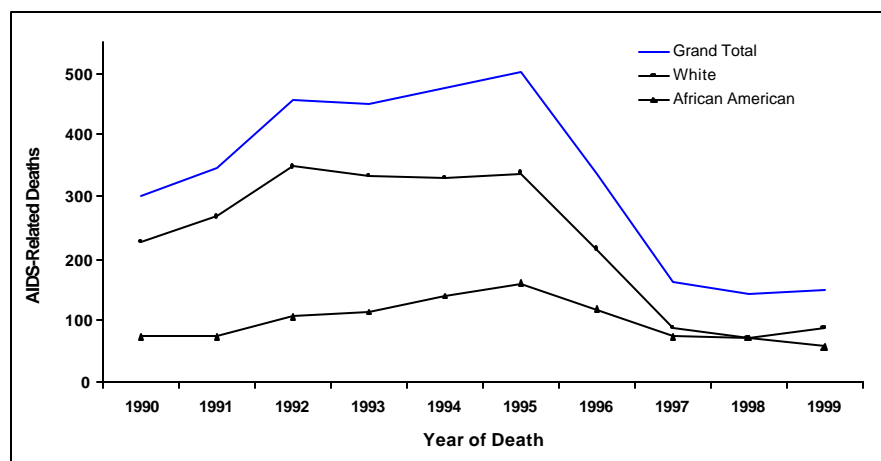


Figure 2. AIDS-related deaths by race/ethnicity and year of death, Missouri, 1990-1999.

**Table 1. HIV and AIDS Cases by Gender, Missouri, Reported 1999 and Cumulative Through December 1999.**

Gender	HIV Cases				AIDS Cases			
	Reported		Cumulative		Reported		Cumulative	
	1999*				1999			
Males	332	80.8%	3,474	83.9%	362	82.6%	7,581	91.0%
Females	79	19.2%	665	16.1%	76	17.4%	750	9.0%
<b>Total</b>	<b>411</b>		<b>4,139</b>		<b>438</b>		<b>8,331</b>	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

1999 in African Americans (32.3) was 8.1 times the rate in whites (4.0). The disproportionate effect of HIV disease on African Americans is also reflected in the fact that, although African

Americans make up approximately 11 percent of Missouri's population, they accounted for 38.4 percent of total AIDS-related deaths in the state in 1999.  
(continued on page 18)

(continued from page 17)

(See Figure 2.) Note that in 1998, the number of deaths from AIDS in African Americans (73) was actually greater than the number in whites (72).

The overrepresentation of African Americans among reported HIV and AIDS cases is seen in different areas of the state. Table 3 compares numbers

and rates for HIV cases reported in 1999 by race/ethnicity and geographic area.

For Hispanics, the rates for HIV and AIDS cases reported in 1999 were approximately three times those seen in whites. However, the numbers of cases reported in Hispanics (11 HIV cases and 11 AIDS cases in 1999) have been relatively small. For other racial/ethnic

groups, the numbers of reported cases have been even smaller. In 1999, 3 HIV cases and 2 AIDS cases were reported in Asian/Pacific Islanders, and 1 HIV case and 1 AIDS case were reported in American Indians. (See Table 2.)

The largest numbers of HIV and AIDS cases, and the highest rates, are in the state's two major metropolitan areas (St. Louis and Kansas City). (See Table 4.) However, HIV infections continue to occur in persons living in rural areas, and HIV and AIDS cases have been reported from most counties in the state. (See Figure 3.)

Having an accurate understanding of current trends in new HIV infections in different at-risk populations is of particular importance for understanding the epidemiology of HIV disease in Missouri. One method for obtaining an estimate of these trends is to examine reported HIV cases (which represent persons more recently infected) by year of initial diagnosis. When this is done

**Table 2. HIV and AIDS Cases by Race/Ethnicity, Missouri, Reported 1999 and Cumulative Through December 1999.**

Race/Ethnicity	HIV Cases				AIDS Cases			
	Reported 1999*		Cumulative		Reported 1999		Cumulative	
White	188	45.7%	2,228	53.8%	209	47.7%	5,553	66.7%
Black	196	47.7%	1,760	42.5%	215	49.1%	2,563	30.8%
Hispanic	11	2.7%	93	2.2%	11	2.5%	164	2.0%
Asian	3	0.7%	15	0.4%	2	0.5%	19	0.2%
American Indian	1	0.2%	11	0.3%	1	0.2%	31	0.4%
Unknown	12	2.9%	32	0.8%	0	0.0%	1	0.0%
<b>Total</b>	<b>411</b>		<b>4,139</b>		<b>438</b>		<b>8,331</b>	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

**Table 3. Reported HIV Cases and Rates by Race/Ethnicity and Geographic Area, Missouri, 1999**

	Total		White, Non-Hispanic		Black, Non-Hispanic		Hispanic	
	Cases	Rate**	Cases	Rate**	Cases	Rate**	Cases	Rate**
St. Louis City†	130	38.3	45	29.8	76	42.8	1	17.5
St. Louis County†	55	5.5	22	2.7	30	18.4	1	7.6
Kansas City†	102	22.7	48	15.9	46	34.9	6	5.9
Outstate Total†	87	2.4	65	1.9	18	13.4	2	4.1
MO Correctional Facilities††	37	--	10	--	26	--	1	--
<b>Missouri</b>	<b>411</b>	<b>7.6</b>	<b>188</b>	<b>4.0</b>	<b>196</b>	<b>32.3</b>	<b>11</b>	<b>12.7</b>

\*\* Per 100,000 population, based on 1998 population estimates.

† Does not include persons living in correctional facilities at the time of diagnosis.

†† Includes state, county and local correctional facilities.

**Table 4. Summary of Reported HIV and AIDS Cases, Missouri, 1982–1999**

Geographic Area	HIV Cases				AIDS Cases			
	Reported 1999*			Cumulative	Reported 1999			Cumulative
	Case	%	Rate**		Case	%	Rate***	
St. Louis City†	130	(31.6%)	.....38.3	1,222 (29.5%)	147	(33.6%)	.....43.3	2,315 (27.9%)
St. Louis County†	55	(13.4%)	.....5.5	535 (12.9%)	68	(15.5%)	.....6.8	1,287 (15.6%)
Kansas City†	102	(24.8%)	.....22.7	1,061 (25.6%)	112	(25.6%)	.....24.9	2,370 (28.5%)
Outstate†	87	(21.2%)	.....2.4	1,029 (24.9%)	102	(23.3%)	.....2.8	2,157 (25.6%)
Missouri Correctional Facilities††	37	(9.0%)	.....--	292 (7.1%)	9	(2.1%)	.....--	202 (2.4%)
<b>Missouri Total</b>	<b>411</b>	<b>(100.0%)</b>	<b>.....7.6</b>	<b>4,139 (100.0%)</b>	<b>438</b>	<b>(100.0%)</b>	<b>.....8.1</b>	<b>8,331 (100.0%)</b>

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

\*\* Per 100,000 population, based on 1998 population estimates.

† Does not include persons living in correctional facilities at the time of diagnosis.

†† Includes state, county and local correctional facilities.

for HIV cases reported in the state in recent years, the overall trend in diagnosed cases has been generally downward. More specifically, as shown in Figure 4, the trends in diagnosed cases from three of the four major groups at risk for HIV infection have been generally downward (the exception has been cases reported from heterosexual contacts).

While the overall downward trend in diagnosed HIV cases could, at least in part, be due to changes in the HIV testing behaviors of at-risk persons, or to changes in HIV testing practices by providers, it also may represent an overall decrease in recent years in the number of new HIV infections (HIV incidence) in Missouri. However, it must be strongly emphasized that even if there has been an overall decrease in new HIV infections in the state, there are still substantial numbers of persons who are being infected each year. Approximately 480 Missourians, the largest proportion of whom were men who have sex with men, were diagnosed with HIV infection in 1999, and the actual number of new infections occurring annually in the state may be appreciably higher. Also, the fact that the number of diagnosed heterosexual contact HIV cases has not been decreasing is an additional cause for concern.

## Summary of HIV Disease (and Related Issues) in the Major At-Risk Populations

### A. MEN WHO HAVE SEX WITH MEN

Although the annual number of newly diagnosed HIV cases among men who have sex with men (MSM) has been decreasing (see Figure 4), the largest numbers of reported HIV (and AIDS) cases continue to come from this population (192 HIV cases and 256 AIDS cases were reported in MSM in 1999). (See Table 5 on page 20.)

HIV disease is a problem among both white and African American MSM. More cases have been reported from white MSM (1,511 HIV cases and 4,188

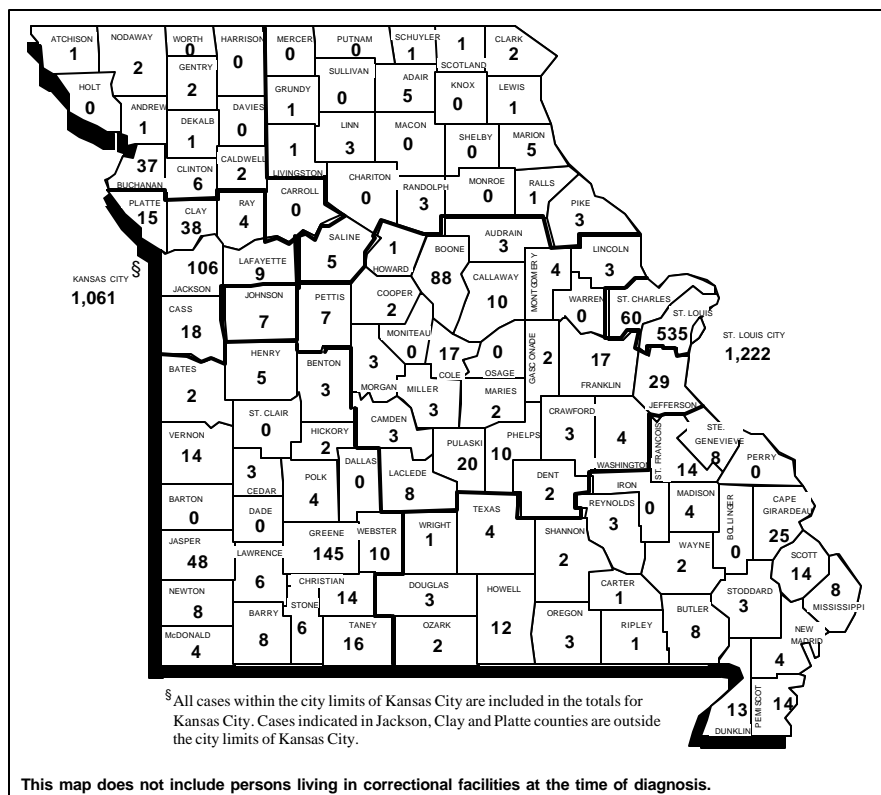


Figure 3. Reported HIV cases by county, Missouri, cumulative through 1999.

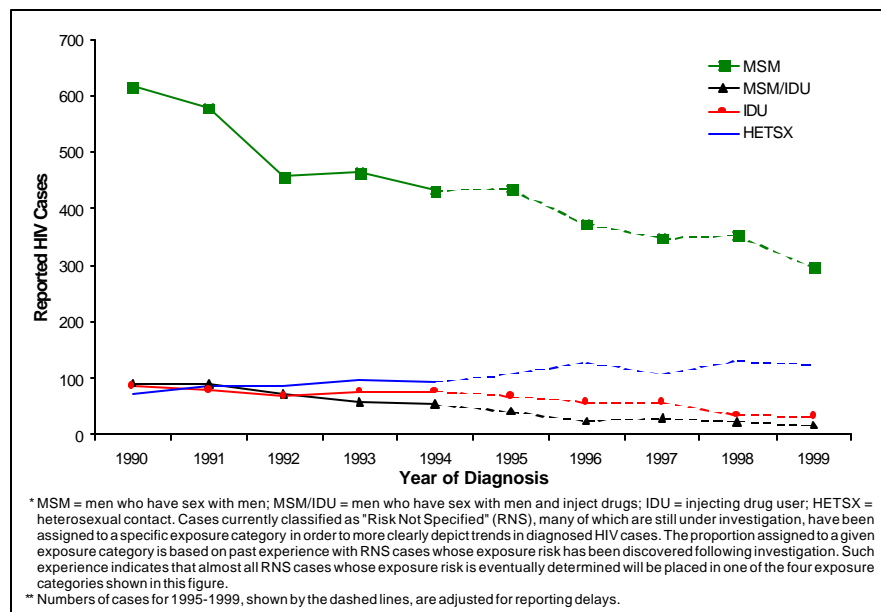


Figure 4. Reported HIV Cases by Selected Exposure Categories\* and Year of Diagnosis\*\*, Missouri, 1990–1999

AIDS cases) than from African American MSM (895 HIV cases and 1,599 AIDS cases). (See Table 6 on page 20.) However, given the fact that there are likely many more white MSM than African American MSM in Missouri,

African American MSM appear to be experiencing higher rates of HIV infection.

Hispanic MSM have accounted for 57 HIV cases (2.3% of total MSM HIV *(continued on page 20)*

**Table 5. HIV and AIDS Cases by Exposure Category, Missouri, Reported 1999 and Cumulative Through December 1999.**

	HIV Cases				AIDS Cases			
	Reported		Cumulative		Reported		Cumulative	
	1999*				1999			
Adult/Adolescent								
Men Who Have Sex With Men	192	46.8%	2,493	60.8%	256	58.7%	5,928	71.7%
Men Who Have Sex With Men and Inject Drugs	11	2.7%	261	6.4%	31	7.1%	748	9.0%
Injecting Drug Users	20	4.9%	381	9.3%	38	8.7%	597	7.2%
Heterosexual Contact	84	20.5%	649	15.8%	73	16.7%	639	7.7%
Hemophilia/Coagulation Disorder	1	0.2%	28	0.7%	1	0.2%	143	1.7%
Blood Transfusion or Tissue Recipient	1	0.2%	12	0.3%	3	0.7%	96	1.2%
Risk Not Specified	101	24.6%	275	6.7%	34	7.8%	116	1.4%
Adult/Adolescent Subtotal	410	100.0%	4,099	100.0%	436	100.0%	8,267	100.0%
Pediatric (<13 years old)								
Mother With/At Risk of HIV Infection	1	100.0%	33	82.5%	2	100.0%	44	68.8%
Hemophilia/Coagulation Disorder	0	0.0%	5	12.5%	0	0.0%	14	21.9%
Blood Transfusion or Tissue Recipient	0	0.0%	0	0.0%	0	0.0%	5	7.8%
Risk Not Specified	0	0.0%	2	5.0%	0	0.0%	1	1.6%
Pediatric Subtotal	1	100.0%	40	100.0%	2	100.0%	64	100.0%
Total	411		4,139		438		8,331	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

(continued from page 19)

cases), and 113 AIDS cases (1.9% of total MSM AIDS cases).

Figure 5 shows reported HIV cases in white and African American MSM by year of diagnosis. For total HIV cases in MSM, as well as for white MSM cases and African American MSM cases, the annual numbers of diagnosed cases have been generally decreasing. The annual number of diagnosed HIV cases in Hispanic MSM (not shown in the figure) has remained low in recent years (less than 10 per year), and has not shown noticeable upward or downward trends.

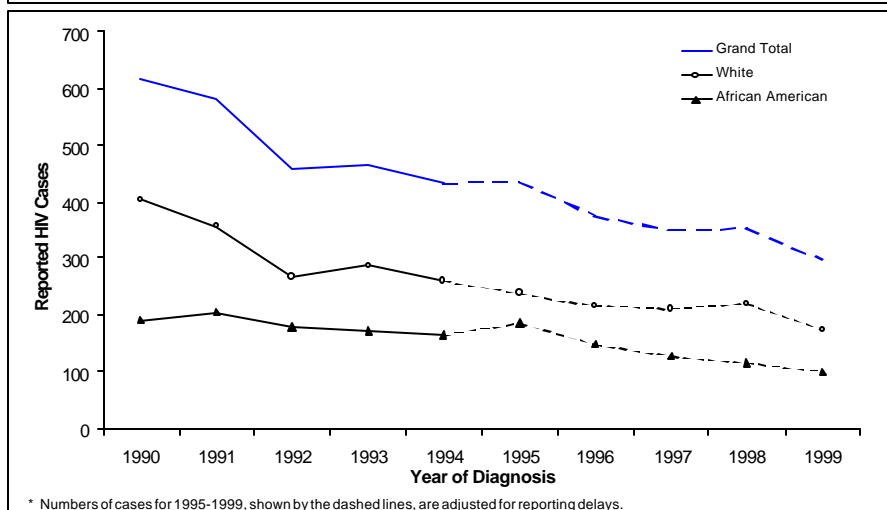
Most MSM who become infected with HIV likely do so while in their twenties or thirties. African American MSM may, in general, be infected at somewhat younger ages compared to white MSM.

The majority of HIV-infected MSM, and especially HIV-infected African American MSM, were residing in St. Louis City, St. Louis County, or Kansas City at the time of diagnosis. Seventy-eight percent of reported HIV cases in MSM were diagnosed in men living in either St. Louis City, St. Louis County,

**Table 6. HIV and AIDS Cases in Men Who Have Sex With Men by Race/Ethnicity, Missouri, Reported 1999 and Cumulative Through December 1999.**

Race/Ethnicity	HIV Cases				AIDS Cases			
	Reported 1999*		Cumulative		Reported 1999		Cumulative	
White	120	62.5%	1,511	60.6%	137	53.5%	4,188	70.6%
Black	55	28.6%	895	35.9%	116	45.3%	1,599	27.0%
Hispanic	8	4.2%	57	2.3%	2	0.8%	113	1.9%
Other/Unknown	9	4.7%	30	1.2%	1	0.4%	28	0.5%
<b>Total</b>	<b>192</b>		<b>2,493</b>		<b>256</b>		<b>5,928</b>	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.



\* Numbers of cases for 1995-1999, shown by the dashed lines, are adjusted for reporting delays.

**Figure 5. Reported HIV cases in men who have sex with men by race/ethnicity and year of diagnosis\*, Missouri, 1990-1999**

or Kansas City; with 68.8 percent of white MSM HIV cases, 95.0 percent of African American MSM HIV cases, and 83.6 percent of Hispanic MSM HIV cases being from one of these three locations. Among the outstate counties, 15 African American MSM HIV cases have been reported from Boone County, and 14 other outstate counties have each reported from 1–5 cases. White MSM HIV cases have been more widely distributed in the outstate counties, with 10 counties (Boone, Buchanan, Cape Girardeau, Cass, Franklin, Greene, Jasper, Jefferson, St. Charles, and St. Francois) each reporting 10 or more cases, and 60 other outstate counties each reporting from 1–9 cases.<sup>2–3</sup>

In addition to the surveillance data described above, other sources of information are available that provide increased understanding of certain behaviors and perceptions of Missouri MSM which can place them at risk of acquiring HIV infection.

#### **HIV Testing Survey II (HITS II) in MSM in Gay Bars**

In 1998, the HIV Testing Survey II (HITS II), a behavioral study of persons at-risk for HIV infection in Missouri, was conducted by the Saint Louis University School of Public Health. It included interviews with 102 MSM in gay bars in St. Louis, Kansas City, and Springfield. The results<sup>4</sup> indicate the continuing presence, in the MSM populations surveyed, of behaviors associated with HIV transmission.

Of those MSM participants responding to the survey, 63.7 percent reported having other sexual partners besides a primary partner (of those reporting other partners, the median number of other partners was 3). Of those respondents with a primary male partner (66.7% of the total), 29.4 percent reported that a condom was never used, and 32.4 percent reported that a condom was always used, when having receptive sex with the primary partner.

The results also indicate that non-injectable illicit drug use is a behavior engaged in by some MSMs. Of the 102 individuals from gay bars who were surveyed, 43.1 percent reported that they had used some form of non-injectable illicit drug in the last past twelve months.

More encouraging were the results which showed that a relatively high percentage (78.4%) of the MSM participants surveyed had been tested at least once for HIV, and that a majority (62.5%) were being tested on a regular basis.

#### **Other Sexually Transmitted Diseases (STDs) in MSM**

Reports of increases in bacterial sexually transmitted diseases (STDs) among MSM in places such as San Francisco<sup>5</sup> and King County, Washington<sup>6</sup>, apparently associated with an increase in unsafe sexual practices among MSM in these locations, have been of significant concern because such unsafe practices could also lead to increases in HIV incidence.

In Missouri, data from cases of bacterial STDs reported during recent years do not provide evidence that any substantial outbreaks of these STDs have been occurring among MSM in the state. However, the potential occurrence of future outbreaks in this population must continue to be monitored.

The Centers for Disease Control and Prevention (CDC) has stated that “the substantial reduction in sexual risk behaviors among MSM and the decreases in rectal gonorrhea during the 1980s and early 1990s cannot be assumed to be maintained indefinitely. The availability of ART [increasingly effective antiretroviral therapy] and the possible perception of lower risk for infection from persons receiving ART may lead to misunderstandings and complacency toward safe-sex messages.”<sup>7</sup> Reinforcing this concern are results from the HITS II study which indicate that in Missouri some MSM are

now less careful than before with regard to risky behaviors because of their awareness of more effective HIV treatments. The MSM participants in the study were asked to respond to the statement: “Sometimes I am less careful about being safe with sex or drugs because I know there are good treatments for HIV now.” Of those responding, 5.6 percent strongly agreed with the statement, and another 11.1 percent indicated mild agreement. The participants were also asked to respond to the related statement: “I’m less concerned about getting HIV than I used to be because there are good treatments now.” Of those responding, 8.9 percent strongly agreed, and another 23.3 percent indicated mild agreement.

#### **B. HETEROSEXUAL CONTACTS**

In 1999, 84 HIV cases and 73 AIDS cases were reported in heterosexual contacts in Missouri. (See Table 5.) Of the 649 total reported HIV cases in heterosexual contacts, 300 (46.2%) were in African American females and 177 (27.3%) in white females. Numbers of reported heterosexual contact HIV cases in males were much smaller: 112 (17.3%) in African American males, and 40 (6.2%) in white males. (See Table 7 on page 22.) Heterosexual contact is the predominant way that women in Missouri are infected with HIV (approximately three out of every four adult/adolescent women infected with HIV acquired their infection through heterosexual contact). Among more recently infected women, a higher proportion are being infected through this mode of transmission.

African Americans are very disproportionately represented among reported HIV and AIDS cases in heterosexual contacts. Of the 649 heterosexual contact HIV cases reported in Missouri, 412 (63.5%) were in African Americans, compared to 217 (33.4%) in whites. Hispanics have accounted for 13 (2.0%) heterosexual contact HIV cases. Very  
(continued on page 22)

**Table 7. HIV and AIDS Cases in Heterosexual Contacts by Race/Ethnicity and Gender, Missouri, Reported 1999 and Cumulative Through December 1999.**

Race/Ethnicity and Gender	HIV Cases				AIDS Cases			
	Reported 1999*		Cumulative		Reported 1999		Cumulative	
Males								
White	3	3.6%	40	6.2%	4	5.5%	75	11.7%
Black	21	25.0%	112	17.3%	16	21.9%	75	11.7%
Other/Unknown	1	1.2%	6	0.9%	1	1.4%	6	0.9%
Females								
White	11	13.1%	177	27.3%	20	27.4%	212	33.2%
Black	46	54.8%	300	46.2%	30	41.1%	259	40.5%
Other/Unknown	2	2.4%	14	2.2%	2	2.7%	12	1.9%
Total	84		649		73		639	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

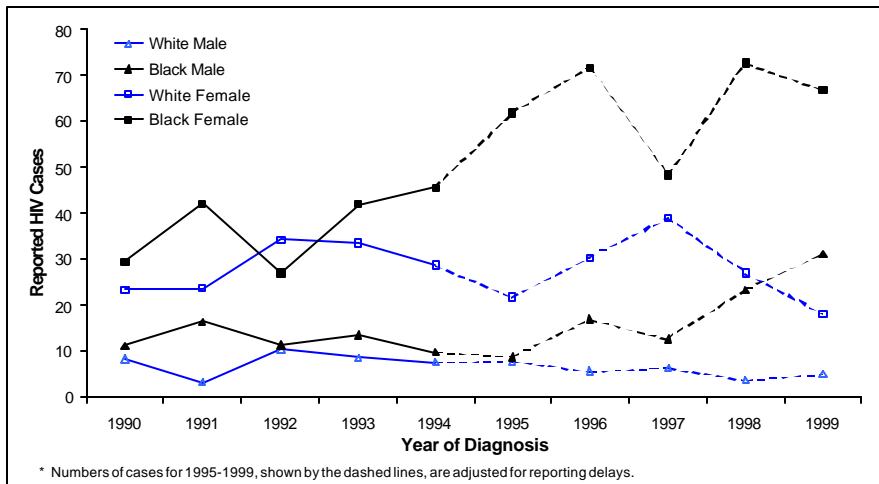


Figure 6. Reported HIV cases in heterosexual contacts by race/ethnicity, gender and year of diagnosis\*, Missouri, 1990–1999.

(continued from page 21)

few heterosexual contact HIV (or AIDS) cases have been reported from persons in other racial/ethnic groups.

In contrast to the situation in MSM, the annual number of diagnosed HIV cases in heterosexual contacts in Missouri has been generally increasing. (See Figure 4.) This general upward trend has been primarily due to the overall upward trend in African American female cases (although there is recent evidence of possible plateauing in the annual number of diagnosed cases in this population). In addition, the annual number of diagnosed cases in African American males has been increasing for three of

the past four years. In contrast, diagnosed cases in white females and white males have not shown noticeable upward or downward trends in recent years, and the overall number of cases in white males has been small. (See Figure 6.)

The largest proportion of heterosexual contact cases were probably initially infected while in their twenties; but teenagers (especially females) are also being infected through heterosexual transmission. Of the 300 African American female heterosexual contact HIV cases, 49 (16.3%) were diagnosed in teenagers; of the 177 cases in white females, 17 (9.6%) were diagnosed in teenagers. Less than 5 percent of

heterosexual contact HIV cases in males were diagnosed in teenagers.

Of reported HIV cases in heterosexual contacts, 66.1 percent were diagnosed in persons living in either St. Louis City, St. Louis County, or Kansas City; with 77.4 percent of African American male cases and 85.0 percent of African American female cases, but only 15.8 percent of white male cases and 39.4 percent of white female cases, being from one of these three locations. (Approximately 78 percent of the state's African American population, and 27 percent of the white population, reside in either St. Louis City or County, or Kansas City.) Among the outstate counties, 8 African American heterosexual contact HIV cases have been reported from Boone County, 7 from Greene County, 4 from Mississippi County, and 4 from Pulaski County. Twenty-two other outstate counties have each reported from 1–3 African American cases. White heterosexual contact HIV cases have been more widely distributed in the state. Thirteen white cases have been reported from Greene County, 11 from Jasper County, 9 from St. Charles County, 7 from Jefferson County, and 6 from Howell County. Forty-six other outstate counties have each reported from 1–5 white cases. None of the outstate counties are showing evidence of upward trends in diagnosed HIV cases in either white or African American heterosexual contacts.<sup>2-3</sup>

Additional information is available on the occurrence of particular behaviors among certain heterosexual populations in Missouri which can result in increased risk of acquiring HIV infection.

#### HIV Testing Survey II (HITS II) in (Heterosexual) STD Clinic Patients

The 1998 HITS II study described above also included interviews with 95 STD clinic patients in St. Louis, Kansas City, and Springfield. The results<sup>4</sup> provide information on the behaviors occurring in these specific populations of heterosexuals who are clearly at high risk for infections transmitted through

sexual contact. The study findings indicate the continuing presence in these populations of behaviors associated with transmission of HIV and other STDs.

Of male participants, 75.0 percent reported having other sexual partners besides their primary partner; the median number of other partners was 2. By contrast, the majority of female participants (61.5%) reported no other current sexual partners besides their primary partner. When having vaginal sex with the primary partner, 31.7 percent of male respondents and 38.5 percent of female respondents reported never using a condom. Of those who reported having sexual intercourse with another partner(s) beside a primary partner, only 27.9 percent of male respondents and 33.3 percent of female respondents reported always using a condom.

Of all STD clinic respondents, 73.7 percent stated they had previously been tested for HIV, but only 41.4 percent indicated they were being tested regularly. Given the increasing importance of heterosexual HIV transmission in Missouri, the fact that a large percentage of these heterosexual STD clinic patients are not being tested on a regular basis may indicate the need to increase HIV counseling and testing efforts among this population.

The results also indicate that some of the respondents are now less careful than before with regard to risky behaviors because of their awareness of more effective HIV treatments. Participants were asked to respond to the statement: "Sometimes I am less careful about being safe with sex or drugs because I know there are good treatments for HIV now." Of those responding, 17.9 percent strongly agreed with the statement, and another 12.6 percent indicated mild agreement. The participants were also asked to respond to the related statement: "I'm less concerned about getting HIV than I used to be because there are good treatments now." Of those responding, 21.1 percent

strongly agreed, and another 21.1 percent indicated mild agreement.

Finally, the results indicate that a noticeable proportion of the STD clinic respondents have used non-injectable illicit drugs. Of the 95 respondents, 41 (43.2%) reported that they had used some form of these drugs in the past 12 months.

### **1999 Youth Risk Behavior Survey (YRBS)**

The 1999 Youth Risk Behavior Survey (YRBS) was administered to 1,652 students in 23 public high schools in Missouri during the spring of 1999, and the results are believed to be representative of all students in grades 9–12 in the state. Results<sup>7</sup> indicate the continuing presence in Missouri teenagers of behaviors associated with the transmission of STDs (including HIV).

Of those high school students surveyed, 56.8 percent reported having had sexual intercourse (including 70.5 percent of those >18 years of age), and 19.5 percent reported having had sexual intercourse with >4 people. Of those who reported having sexual intercourse during the past three months (41.6% of the total), 25.4 percent drank alcohol or used drugs before their last sexual intercourse, and only 59.8 percent used a condom during their last episode of intercourse.

### **C. INJECTING DRUG USERS (HETEROSEXUAL AND MSM)**

Needle sharing among injecting drug users (IDUs) has been a less common means of transmitting HIV in Missouri compared to the situation in a number of other states. However, (heterosexual) IDUs make up 9.3 percent of the state's reported HIV cases and 7.2 percent of reported AIDS cases, and men who have sex with men and inject drugs (MSM/IDU) make up 6.4 percent of reported HIV cases and 9.0 percent of reported AIDS cases. (See Table 5.)

The annual number of diagnosed HIV cases in both IDUs and MSM/IDUs has

generally been declining (see Figure 4), and may represent a decrease in the number of new HIV infections (HIV incidence) in persons in these exposure categories. In 1999, 20 HIV cases and 38 AIDS cases were reported in IDUs, and 11 HIV cases and 31 AIDS cases were reported in MSM/IDUs. (See Table 5.)

Males, and African Americans, are disproportionately represented among reported HIV cases in IDUs (see Table 8 on page 24). Males make up 70.3 percent of the 381 total reported HIV cases in IDUs (including 70.9 percent of all white IDU cases and 68.8 percent of all African American IDU cases). African Americans (who comprise about 11 percent of Missouri's population) make up 50.4 percent of total reported HIV cases in IDUs, whites account for 45.9 percent, and Hispanics 2.6 percent (10 cases, 8 of which were in males).

African American men appear disproportionately represented among reported HIV cases in MSM/IDUs (see Table 9 on page 24). African American men make up 33.7 percent of the 261 total reported HIV cases in MSM/IDUs, and white men account for 63.6 percent.

The largest proportion of IDU and MSM/IDU cases were probably initially infected while in their later twenties and thirties.

Of reported HIV cases in IDUs, 62.0 percent were diagnosed in persons living in either St. Louis City, St. Louis County, or Kansas City; with 92.5 percent of African American cases and 31.5 percent of white cases being from one of these three locations. Among the outstate counties, 9 have each reported 1–2 African American IDU HIV cases. Compared to cases in African Americans, white IDU HIV cases have been more widely distributed in the state. Sixteen white cases have been reported from Greene County, and 6 cases have been reported from each of three other outstate counties (Boone, Jasper, and  
*(continued on page 24)*

**Table 8. HIV and AIDS Cases in Injecting Drug Users by Race/Ethnicity and Gender, Missouri, Reported 1999 and Cumulative Through December 1999.**

through December 1999.

Race/Ethnicity and Gender	HIV Cases				AIDS Cases			
	Reported		Cumulative		Reported		Cumulative	
	1999*				1999			
Males								
White	7	35.0%	124	32.5%	6	15.8%	190	31.8%
Black	7	35.0%	132	34.6%	12	31.6%	198	33.2%
Other/Unknown	0	0.0%	12	3.1%	2	5.3%	20	3.4%
Females								
White	2	10.0%	51	13.4%	5	13.2%	78	13.1%
Black	4	20.0%	60	15.7%	12	31.6%	105	17.6%
Other/Unknown	0	0.0%	2	0.5%	1	2.6%	6	1.0%
Total	20		381		38		597	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

Of male participants, 47.5 percent reported having other sexual partners besides their primary partner; the median number of other partners was 3. Of female participants, 51.4 percent reported having other sexual partners besides their primary partner; the median number of other partners was 4. When having vaginal sex with the primary partner, 70.5 percent of male respondents and 40.5 percent of female respondents reported never using a condom. Of those who reported having sexual intercourse with another partner(s) beside a primary partner, only 35.5 percent of male respondents and 35.0 percent of female respondents reported always using a condom.

**Table 9. HIV and AIDS Cases in Men Who Have Sex With Men and Inject Drugs by Race/Ethnicity, Missouri, Reported 1999 and Cumulative Through December 1999.**

Race/Ethnicity	HIV Cases				AIDS Cases			
	Reported 1999*		Cumulative		Reported 1999		Cumulative	
White	6	54.5%	166	63.6%	18	58.1%	502	67.1%
Black	5	45.5%	88	33.7%	12	38.7%	228	30.5%
Hispanic	0	0.0%	4	1.5%	1	3.2%	13	1.7%
Other/Unknown	0	0.0%	3	1.1%	0	0.0%	5	0.7%
<b>Total</b>	<b>11</b>		<b>261</b>		<b>31</b>		<b>748</b>	

\* HIV cases reported during 1999 which remained HIV cases at the end of that year.

Of all IDU respondents, 88.8 percent stated they had previously been tested for HIV, but only 43.7 percent indicated they were being tested regularly. The fact that a large percentage of these individuals are not being tested on a regular basis may indicate the need to increase HIV counseling and testing efforts among IDU populations.

Results from HITS II also indicate that non-injectable illicit drug use is a frequent behavior among the IDUs in the study. Of the 98 IDUs surveyed (all of whom reported using some form of injectable drug in the past twelve months), 70 (71.4%) reported also using cocaine, and 53 (54.1%) reported using crack.

In addition, the results provided descriptions of specific high-risk behaviors associated with injecting drug use and transmission of HIV. Of the 98 IDUs surveyed, 70 (71.4%) indicated that they do not share needles, 16 (16.3%) indicated that they share needles more than half of the time, and 10 (10.2%) indicated that they share needles half of the time or less. The relatively high proportion of respondents who state they do not share needles might be reflective of a more general trend among IDUs in the state, and could possibly be related to the fact that IDUs in Missouri have made up a smaller proportion of reported

(continued from page 23)

St. Charles). Thirty-five additional outstate counties have each reported from 1–3 cases.<sup>2–3</sup>

Of reported HIV cases in MSM/IDUs, 66.8 percent were diagnosed in men living in either St. Louis City, St. Louis County, or Kansas City; with 87.5 percent of African American cases and 57.4 percent of white cases being from one of these three locations. Among the outstate counties, seven have each reported one African American MSM/IDU HIV case. White MSM/IDU HIV cases have been more widely distributed in the outstate counties. Eleven white cases have been reported from Greene County; 26 other outstate counties have each reported from 1–4 cases.<sup>2–3</sup>

Additional information is available on the occurrence of particular behaviors among certain IDU populations in Missouri which can result in increased risk of acquiring HIV infection.

#### **HIV Testing Survey II (HITS II) in IDUs in Drug Treatment**

The 1998 HITS II study described above also included interviews with 98 IDUs in drug treatment facilities in St. Louis, Kansas City, and Springfield. The findings of the study<sup>4</sup> provide information on the behaviors occurring in these predominantly heterosexual populations of IDUs. The results indicate the continuing presence in these populations of behaviors associated with transmission of HIV and other STDs.

HIV and AIDS cases than is seen in a number of other states. However, it remains a significant concern that almost 30 percent of the IDUs in the survey reported sharing needles, and points to the ongoing need for prevention services in IDU populations.

Finally, results from the HITS II study indicate that there are some IDUs who are less careful than before with regard to risky behaviors because of their awareness of more effective HIV treatments. The IDUs interviewed in the study were asked to respond to the statement: "Sometimes I am less careful about being safe with sex or drugs because I know there are good treatments for HIV now." Of those responding, 34.0 percent strongly agreed with the statement, and another 16.5 percent indicated mild agreement. The participants were also asked to respond to the related statement: "I'm less concerned about getting HIV than I used to be because there are good treatments now." Of those responding, 36.1 percent strongly agreed, and another 18.6 percent indicated mild agreement.

#### **D. PERINATAL HIV TRANSMISSION**

The Missouri Department of Health has knowledge of 271 infants born from 1993–1999 to mothers who were infected with HIV and who were Missouri residents at the time of the birth. Of these 271 infants (termed HIV-exposed infants), 31 (11.4%) were subsequently found to be infected with HIV as a result of perinatal (mother-to-infant) transmission; 240 (88.6%) were not infected.

The proportion of HIV-exposed infants who became infected was noticeably less for those born during the period from 1995–1998 compared to those born during the earlier period from 1993–1994 (5.9% vs. 27.5%). This difference likely reflects the use, starting in mid- to late-1994, of zidovudine (ZDV, AZT) treatment to reduce the risk of perinatal HIV transmission. During 1999, 33 HIV-infected mothers are known to have

given birth; none (0.0%) of their infants appear to have been infected.

African Americans have been disproportionately represented among HIV-exposed infants. Of the 202 HIV-exposed infants born from 1995–1999 (the period during which specific guidelines for the use of antiretroviral drugs to reduce perinatal HIV transmission risk have been in place), 24.3 percent were white, 71.3 percent were African American, 2.5 percent were Hispanic, and 2.0 percent were of other/unknown race/ethnicity. Of the 49 white HIV-exposed infants born during this period, 4 (8.2%) were subsequently found to be infected with the virus; of the 144 African American HIV-exposed infants, 8 (5.6%) were subsequently found to be infected.

Of the 202 HIV-exposed infants born from 1995–1999, the largest number, 71 (35.1%), were from St. Louis City, followed by 65 (32.2%) from the outstate area. The largest number of HIV-exposed infants subsequently found to be infected (7) were from the outstate area, followed by St. Louis City (3).

From 1995–1999, only 3.9 percent of infants whose mothers were diagnosed as HIV infected before or during pregnancy became infected, compared to 21.7 percent of infants whose mothers were not diagnosed until after the postpartum period. Early diagnosis and treatment of HIV-infection in pregnant women is clearly a key strategy for preventing perinatal HIV transmission.

#### **Comments:**

HIV disease continues to be a very significant problem in Missouri.

- Almost 500 Missourians were diagnosed with HIV infection in 1999, and the actual number of new infections occurring annually in the state may be appreciably higher. The infection remains incurable and deadly. Current treatments, while slowing the progress of the disease for many persons, are not a cure, are associated with

significant adverse reactions, do not remain effective over time in many persons, and are expensive. *Emphasis must continue to be placed on prevention of new infections.*

- Prevention efforts must be directed to several at-risk groups:

1) **MSM.** Although the numbers of newly diagnosed HIV cases in MSM have been generally decreasing in recent years, this at-risk population continues to easily account for the majority of reported HIV and AIDS cases in Missouri. Behavioral studies appear to indicate the ongoing presence of risky behaviors in many MSM, and reports of increases in risky behaviors in MSM in other parts of the county point to the need for ongoing prevention efforts directed toward the MSM population.

2) **Certain Populations of Heterosexuals.** The annual number of diagnosed HIV cases in heterosexual contacts has, in general, been increasing in recent years. An estimated 125 heterosexual contacts were diagnosed with HIV infection in 1999, and the actual number of new infections occurring each year in this population may be considerably higher. Behavioral studies indicate the continuing occurrence of risky sexual behaviors, not only in traditional high risk populations (such as heterosexual STD clinic patients), but also in many Missouri teenagers.

3) **Persons Who Inject Illicit Drugs.** While HIV transmission associated with injecting drug use has not been as large a problem in Missouri as in some other states, Missouri IDUs continue to be infected through sharing of injection equipment (and through risky sexual behaviors). The continuing presence of high risk sexual and needle-sharing behaviors among Missouri IDUs is indicated by behavioral studies, and these findings confirm the ongoing risk for transmission of HIV (and other sexual and bloodborne pathogens) in IDU populations in the state.

*(continued on page 26)*

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- 4) **Infants of HIV-Infected Mothers.** The number of Missouri infants infected with HIV through perinatal (mother-to-infant) transmission has been very low in recent years. However, the potential for such transmission, which is almost always preventable, remains. It is crucial that HIV-infected pregnant women be identified (preferably before they become pregnant) and offered appropriate treatment for their own disease and to reduce the risk of transmission to their child. Additionally, it must be emphasized that the best way to prevent perinatal HIV transmission is to prevent the occurrence of HIV infection in women of childbearing age.
- In each of the four at-risk groups just mentioned, African Americans appear clearly overrepresented. The disproportionate impact of HIV disease in certain African American populations requires that particular attention be given to prevention efforts developed to assist these individuals.
  - Medical providers should routinely conduct appropriate risk assessments on their patients, provide counseling and any necessary referrals for those who are at risk for HIV infection, and strongly encourage all at-risk persons to be tested for HIV. For individuals who continue to engage in risky behaviors, ongoing periodic testing (and ongoing risk reduction counseling) should be provided.
  - All medical facilities, including clinics and physicians' offices, should have written protocols in place for managing occupational exposures to HIV (and other bloodborne pathogens). These protocols should be periodically updated to remain consistent with current guidelines.<sup>8-11</sup>
  - Medical providers should be aware of management options, and current recommendations,<sup>12</sup> for situations in which individuals have non-occupational (sexual or injecting-drug-use) exposure to HIV.

- Medical providers should promptly report, as required by Missouri law,<sup>13-14</sup> all cases of HIV infection/AIDS to public health officials. Providers in St. Louis City and St. Louis County should report cases to the St. Louis City Department of Health and Hospitals at (314) 658-1159. Providers in the five-county Kansas City metropolitan area should report to the Kansas City Health Department at (816) 983-4200. All other providers should report to MDOH's Office of Surveillance at (573) 751-6463.
- Medical providers should also be aware of current guidelines<sup>15</sup> for the screening, diagnosis, and treatment of sexually transmitted diseases (STDs) such as chlamydia, gonorrhea, syphilis, and trichomoniasis. The presence of these conditions is known to increase HIV infectivity and HIV susceptibility, and the early detection and treatment of curable STDs should be a major component of HIV prevention programs.<sup>16</sup> In Missouri, excellent educational opportunities for physicians and other clinicians in the diagnosis and treatment of STDs are available through the St. Louis STD/HIV Prevention and Training Center. (314/747-0294 or [http://www.umsl.edu/services/itc/std\\_ptc.html](http://www.umsl.edu/services/itc/std_ptc.html))
- Ongoing efforts are needed to help at-risk persons modify those behaviors which can result in the transmission of HIV. Families, schools, churches, health care providers, and community-based organizations, as well as public health agencies, all need to be involved in this task.
- Finally, prevention activities must continue to be based on a thorough understanding of: 1) the epidemiology of the HIV/AIDS epidemic in one's geographic area, and 2) which prevention efforts are likely to have success in the population(s) being targeted. (More information on HIV prevention can be obtained by contacting the Section of STD/HIV/AIDS Prevention and Care Services at 573/751-6144, or by visiting their

web site at <http://www.health.state.mo.us/sshapes/SSHAPCS.html>.)

For a more detailed description of the epidemiology of HIV/AIDS in Missouri, see the *1999 Epidemiologic Profiles of HIV/AIDS and STDs in Missouri*. This document, along with other reports on HIV/AIDS and STDs, is available on the MDOH web site at [http://www.health.state.mo.us/HIV\\_STD/HIVstatsheet.html](http://www.health.state.mo.us/HIV_STD/HIVstatsheet.html).

## REFERENCES:

1. HIV cases are persons infected with human immunodeficiency virus (HIV) whose disease has not progressed to the point that they have met the AIDS case definition and become AIDS cases. In general, HIV cases represent individuals more recently infected with HIV, while AIDS cases represent persons less recently infected.
2. Persons residing in correctional facilities at the time of diagnosis are not included in these figures.
3. For purposes of this report, outstate counties include all Missouri counties except St. Louis County (and St. Louis City), Jackson County, Platte County, and Clay County.
4. A more detailed summary of the results from the HITS II study is presented in the *1999 Epidemiologic Profiles of HIV/AIDS and STDs in Missouri*, available in PDF format on the MDOH web site.  
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## Influenza Vaccine Recommendations

(continued from page 9)

a physician. Prophylactic use of the antiviral agents amantadine or rimantadine is an option for preventing influenza A among such persons. However, persons who have a history of anaphylactic hypersensitivity to vaccine components but who are also at high risk for complications of influenza can benefit from vaccine after appropriate allergy evaluation and desensitization. Information about vaccine components can be found in package inserts from each manufacturer.

Persons with acute febrile illness usually should not be vaccinated until their symptoms have abated. However, minor illnesses with or without fever do not contraindicate the use of influenza vaccine, particularly among children with mild upper respiratory tract infection or allergic rhinitis.

### Timing

The optimal time to vaccinate persons in high-risk groups is usually from the beginning of October through mid-November, because influenza activity in the United States generally peaks between late December and early March.

### Simultaneous Administration of Other Vaccines, Including Childhood Vaccines

The target groups for influenza and pneumococcal vaccination overlap considerably. For persons at high risk who have not previously been vaccinated with pneumococcal vaccine, health-care providers should strongly consider administering pneumococcal and influenza vaccines concurrently. Both vaccines can be administered at the same time at different sites without increasing side effects. However, influenza vaccine is administered each year, whereas pneumococcal vaccine is not. Children at high risk for influenza-related complications can receive influenza vaccine at the same time they receive other routine vaccinations.

## New Web-Based Training on Hepatitis C for Health Professionals

The Centers for Disease Control and Prevention (CDC) has posted on its World-Wide Web site an interactive web-based training program titled, "Hepatitis C: What Clinicians and Other Health Professionals Need to Know." The program is at <http://www.cdc.gov/hepatitis>.

This program provides users with up-to-date information on the epidemiology, diagnosis and management of hepatitis C virus (HCV) infection and HCV-related chronic disease. Users also can test their knowledge of the material through study questions at the end of each section and case studies at the end of the program. Continuing medical and nursing education credits are available free from CDC on completion of the training. The American Academy of Family Physicians also will grant the academy's education credits on completion of training and filing with the academy.



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Managing Editor is Eduardo Simoes, M.D., M.Sc., M.P.H., State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

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## NEW

# Missouri Childhood Lead Testing Guidelines

The Missouri Department of Health and the Missouri Medicaid Program jointly announce the release of new Childhood Lead Testing and Follow-Up Guidelines. Developed in cooperation with state and local, public and private health care providers, the new guidelines integrate recommendations of the American Academy of Pediatrics and the Centers for Disease Control and Prevention.

Current data show the proportion of Missouri children with elevated blood lead levels to be **nearly three times higher than the national average**. For this reason all health care providers are advised to test for elevated blood lead levels:

- All children at least twice in their first 24 months of life, e.g. at 12 and 24 months of age (as required by Medicaid).
- Any child between 12 and 72 months (6 years) that do not have a documented blood lead test.

Other changes in the new Childhood Lead Testing and Follow-up Guidelines are:

- Reduced number of questions in the verbal risk assessment.
- Revised confirmatory testing and case follow-up guidelines.
- Revised Medicaid HCY Lead Risk Assessment Guide form that reflects the changes. Revised forms may be obtained by calling the Missouri Medicaid Program at (573) 635-2434.

The revised plan and guidelines are available through the Department of Health web site at <http://www.health.state.mo.us> under "Resource Material," or a laminated copy appropriate for display may be obtained by calling the Missouri Department of Health, Childhood Lead Poisoning Prevention Program at (800) 575-6267 or (573) 526-4911.



# EPIDEMIOLOGIST

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## New Department of Health Recommendations for Additional Tuberculosis and HIV Screening of Sub-Saharan African Immigrants/Refugees

The Centers for Disease Control and Prevention (CDC) recently identified the need for additional tuberculosis (TB) and HIV screening in refugees and immigrants coming to the United States from certain countries in sub-Saharan Africa. CDC reported “serious deficiencies” in the overseas immigrant/refugee medical screening process in some sub-Saharan African nations. CDC has also received reports from several state health departments that refugees from some of these countries have entered the United States with medical conditions—such as infectious TB and HIV infection—that had not been recognized and documented in the overseas screening process.

In Missouri, approximately 3,000 refugees and 6,000 immigrants arrive each year from throughout the world, including persons from sub-Saharan Africa. Although the annual number of sub-Saharan Africans coming into Missouri appears to be relatively small, the problems found in the overseas screening process underscore the need to provide additional medical assistance to these individuals. Consequently, until further notice, the Missouri Department of Health (MDOH) strongly recommends the following:

- Medically evaluate, as soon as possible after their arrival, all refugees and immigrants from Botswana,

Cameroon, Democratic Republic of the Congo, Mali, Mozambique, The Gambia, Uganda, and Zambia. This process should include evaluation for signs and symptoms of TB along with a Mantoux tuberculin skin test.

- Review the chest X-rays of all refugees and immigrants from Botswana, Cameroon, Democratic Republic of the Congo, Mali, Mozambique, The Gambia, and Uganda, and repeat those of substandard quality.
- Provide HIV counseling, and strongly recommend voluntary HIV testing, to all refugees and immigrants from Botswana, Cameroon, Democratic Republic of the Congo, Mali, Mozambique, The Gambia, Uganda, and Zambia. Additional considerations are the following:
  - It is important to try to ensure that any child (14 years of age or younger) who has an HIV-infected parent, or who is sexually active, is tested for HIV infection.
  - All pregnant women should routinely be offered HIV testing.
  - It is prudent to test any adult refugee or immigrant for HIV antibodies prior to administration of a live vaccine.
- All HIV-infected refugees and immigrants should, as part of their medical

evaluation, have a new chest X-ray (along with a Mantoux tuberculin skin test). Note that the chest X-ray should be obtained even if the tuberculin skin test result is negative.

All physicians and other medical providers who care for refugees and immigrants from these African countries are strongly encouraged to follow these guidelines. All organizations that work with these individuals should encourage them to receive appropriate medical evaluation. Such organizations should also provide assistance as needed to help all refugees and immigrants obtain necessary medical services.

If you have questions regarding the tuberculosis recommendations, please contact MDOH's Section of Vaccine-  
*(continued on page 23)*

### Inside this Issue...

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# 1999 Outbreaks of Communicable Disease

Marge Borst, R.N., B.S., C.I.C.  
Section of Communicable Disease  
Control and Veterinary Public Health

Accurately identifying the source of an outbreak requires collaborative interaction among personnel in various roles and work settings. Depending upon the complexity of the outbreak, interaction may involve federal, state, local and facility-based personnel. These persons function as a team with each playing an integral part in resolving the outbreak. The Section of Communicable Disease Control and Veterinary Public Health is grateful for the assistance of persons statewide who contribute time, concerted effort and expertise helping to protect Missouri citizens from infectious diseases.

## 1999 Community Outbreaks

In 1999, 59 communicable disease outbreaks occurring within communities were reported in Missouri. These 59 outbreaks involved 2,183 persons and represent an increase of 63.9 percent from the 36 outbreaks reported in 1998. These outbreaks involved different modes of transmission and a variety of etiologic agents in a number of different settings. See Table 1.

Schools were the most common setting for outbreaks in 1999, accounting for 22 (37.3%) of the 59 reported outbreaks. The largest of the outbreaks was due to a flu-like illness in one school affecting 185 students. Similar flu-like illnesses occurred in 11 other schools with 768 persons reported as ill.

The largest category of outbreaks (16) reported during 1999 was acute gastrointestinal illness (AGI). Eight of the 16 reported AGI outbreaks were associated with contaminated food, one was associated with contaminated water, one highly suspected as associated with contaminated water, three were person-to-person spread, and the remaining three had unknown modes of transmission.

**Table 1. Community disease outbreaks by cause, setting and number of cases, Missouri, 1999.**

Disease/ Mode of Transmission	No. of Outbreaks	Setting	No. of Cases
Acute Gastrointestinal Illness of Unknown Etiology/			
Foodborne	8	CC, 2HC, O, 4R	106
Person-to-Person	3	HC, OT, S	46
Waterborne	2	HC, OT	24
Unknown	3	CP, HC, S	118
Acute Respiratory Illness of Unknown Etiology/			
Person-to-Person	1	OSE	19
Conjunctivitis/Unknown Cause	1	O	26
Cyclospora/Foodborne	1	R	59
Giardiasis/Person-to-Person	1	CC	8
Hepatitis A/			
Foodborne	2	2R	83
Person-to-Person	2	2CC	9
Unknown	1	S	5
Influenza A/Person-to-Person/Air	2	G, S	83
Influenza B/Person-to-Person/Air	1	G	3
Influenza-Like Illness/ Person-to-Person/Air	12	12S	953
Legionellosis/Waterborne	1	O	4
Mononucleosis/Person-to-Person	1	S	27
Pink Eye/Person-to-Person	1	S	84
Salmonellosis			
Foodborne	3	2CHG, FG	93
Person-to-Person	1	CC	5
Vector (chicks/ducks)	1	SW	40
Waterborne	1	G	124
Unknown	1	MS	5
Shigellosis/			
Foodborne	1	G	19
Person-to-Person	4	3CC, S	103
Unknown	1	S	30
Strep Grp A (sore throats)/ Person-to-Person	3	CC, 2S	103
<b>TOTAL</b>	<b>59</b>		<b>2,183</b>
<b>Key:</b>			
CC =Child Care	G =General Community	OSE=Out-of-State	
CHG =Church Gathering	HC =Home/Catered Event	R =Restaurant	
CP =Camp	MS =Multi-state	S =School	
FG =Family Gathering	O =Occupational	SW =Statewide	

The outbreak of acute respiratory illness with unknown etiology was interesting in that 19 of 42 persons traveling to Spain and Portugal returned ill. The symptoms were cough, fever and sore throat, with a combination of either one, two or all symptoms. Five individuals required a visit to a hospital emergency room and three were hospitalized. Tests for *Legionella* and influenza were negative. One sputum specimen was reported as "heavy with *Haemophilus influenzae* serogroup b (Hib)."

An outbreak of conjunctivitis occurred among factory employees. Due to the lack of purulent drainage, 10 eye swab specimens were obtained for viral testing. These cultures were negative. The outbreak ended before further testing could be performed.

*Cyclospora cayetanensis* was responsible for the illness of 59 persons as a direct result of contaminated uncooked basil supplied to two food facilities by a common distributor. *C. cayetanensis* is a protozoan parasite and is the only species of this genus described as a human pathogen. Research has demonstrated that oocysts of *C. cayetanensis* that become seeded on vegetables **cannot** be easily removed by washing. In the United States, foodborne outbreaks have accounted for the majority of recognized cases and have been associated with the consumption of raspberries, mesclun lettuce and basil. This outbreak underscores that new approaches may be required to prevent illnesses associated with foods that have not been traditionally viewed as potentially hazardous.

A Legionellosis outbreak affecting four persons occurred in a workplace with two persons requiring hospitalization. The actual source for *Legionella pneumophila* was not determined.

A variety of *Salmonella* species were responsible for the seven outbreaks listed in Table 1. Foodborne outbreaks were associated with *S. javiana*, *S. muenchen* and *S. enteritidis*. A municipal water supply was associated with a *S.*

**Table 2. Nosocomial disease outbreaks by cause and number of cases, Missouri, 1999.**

<b>Disease/ Mode of Transmission</b>	<b>No. of Outbreaks</b>	<b>No. of Cases</b>
Acute Gastrointestinal Illness of Unknown Etiology/ Person-to-Person	2	134
Acute Lower Respiratory Illness of Unknown Etiology/Person-to-Person	3	81
<i>Clostridium difficile</i> Illness/ Person-to-Person or Environment-to-Person	1	5
Influenza/Person-to-Person/Air	10	368
Influenza-like Illness/ Person-to-Person	3	69
Norwalk/Norwalk-like Illness/ Person-to-Person	2	148
Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)/Person-to-Person	2	15
Scabies/Person-to-Person	7	124
<i>Streptococcus pyogenes</i> (Group A)/ Person-to-Person	1	20
<b>TOTAL</b>	<b>31</b>	<b>964</b>

*typhimurium* waterborne outbreak resulting in 124 persons becoming ill. The water system was found to have two vents in disrepair plus a low chlorine level. The water tower was drained, refilled and hyperchlorinated and the vents repaired. No further illness occurred following these control measures.

The vectorborne outbreak of *S. typhimurium* involved the handling of young fowl, mainly baby chickens and ducks, given to children or purchased by families in celebration of the Easter holiday. This outbreak with identical pulse-field gel electrophoresis (PFGE) patterns received media attention to stress the importance of handwashing after handling baby fowl. Prior to the Easter 2000 season, a press release was issued to remind the public about the risk of acquiring *Salmonella* disease when proper handwashing is not done after handling chicks, ducklings, and other

fowl as well as reptiles. In addition, a brochure on chicks and ducklings was developed and distributed through farm and feed suppliers. (Results of a case-control study performed to identify risk factors associated with this outbreak can be found in the April 14, 2000 edition of the *Morbidity and Mortality Weekly Report* (MMWR), Vol. 49, No. 14.)

Members of the genus *Shigella* were responsible for six outbreaks. One *Shigella sonnei* outbreak occurring in a child care center was the direct result of allowing children to attend and teachers to work while symptomatic with diarrhea.

### 1999 Nosocomial Outbreaks

Health care-associated (nosocomial) outbreaks are a Category II reportable disease or finding that require reporting to the local health authority or Department of Health within three days of first knowledge or suspicion. Historically,  
(continued on page 19)

# Sexually Transmitted Diseases in Missouri: 1999

Robert Hamm, M.D., M.P.H.  
Office of Epidemiology

Kurt Kleier  
Joe Betros  
Office of Surveillance

## Gonorrhea

During 1999, 8,187 cases of gonorrhea were reported in Missouri residents. However, because of underdiagnosis and underreporting, the actual number of Missourians infected with *Neisseria gonorrhoeae* (and with the other sexually transmitted pathogens discussed below) is undoubtedly higher than what is reported here. The rate\* of reported gonorrhea cases in the state in 1999 was 150.5 per 100,000 population, which was slightly higher than the nationwide rate of 133.2. Missouri ranked 15th among the fifty states in rates of reported gonorrhea cases in 1999.

Of total gonorrhea cases reported in Missouri in 1999, 45.5 percent were in males and 54.5 percent were in females. Among African Americans, a slightly higher proportion of cases were reported in males (50.8%) than in females (49.2%). Among whites, a much higher proportion of cases were reported in females (73.3%) than in males (26.7%).

Of the 8,187 cases of gonorrhea reported in 1999, 5,779 (70.6%) were known to have occurred in African Americans, 890 (10.9%) in whites, 53 (0.6%) in Asians, and 6 (0.1%) in Native Americans. In addition, 46 (0.6%) cases were classified as Other Race. For 1,413 (17.3%) cases, race was not indicated. Table 1 shows the numbers and percentages of reported gonorrhea cases in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

\* All rates (except those for congenital syphilis cases) are per 100,000 population, using 1998 population estimates.

Among reported gonorrhea cases, African Americans continue to be very disproportionately represented. In 1999, over six times as many cases were reported in African Americans compared to whites. The rate of reported gonorrhea cases in African Americans in 1999 was 943.1 and the rate in whites was 18.8, resulting in a ratio of African American to white rates of 50:1. However, this ratio has been generally decreasing in recent years; five years previously (1994), it was 71:1. Table 1 shows the rates of reported gonorrhea cases in 1999 in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

A substantial proportion of reported gonorrhea cases in females are in teenagers. In 1999, persons less than 20 years of age made up 44.0 percent of African American female cases, 48.2 percent of white female cases, 24.0 percent of African American male cases, and 19.7 percent of white male cases. Figure 1 shows the distribution of cases by age group for white males and females, and African American males and females.

In 1999, of the 8,187 gonorrhea cases reported, 2,876 (35.1%) were from St. Louis City, 1,897 (23.2%) from Kansas City, 1,797 (21.9%) from St. Louis County, and 1,617 (19.8%) from the remainder of the state (Outstate Missouri). Cases were reported from 81 (71.1%) of the state's 114 counties (and St. Louis City). Figure 2 shows the number of gonorrhea cases reported from each county in 1999.

The highest rate of reported gonorrhea cases in 1999 was in St. Louis City (847.6), followed by Kansas City (422.0), St. Louis County (179.9), and Outstate Missouri (44.3). St. Louis City ranked 3rd among U.S. cities of >200,000 population in rates of reported gonorrhea cases in 1999; Kansas City ranked 15th.

The annual number of reported cases of gonorrhea in Missouri had decreased

each year from 1989 to 1997. In 1998, the 9,463 gonorrhea cases reported represented a 23.6 percent increase from the 7,656 cases reported in 1997. However, from 1998 to 1999, the number of reported cases decreased by 13.5% to 8,187.

From 1998 to 1999, reported cases of gonorrhea in St. Louis County increased by 1.9 percent (from 1,764 to 1,797 cases); St. Louis City cases decreased by 21.2 percent (from 3,652 to 2,876 cases); Kansas City cases decreased by 20.1 percent (from 2,375 to 1,897 cases); and Outstate cases decreased by 3.3 percent (from 1,672 to 1,617 cases).

Trends over time in the **rates** of reported gonorrhea cases parallel the trends in the actual numbers of reported cases. Figure 3 shows trends in gonorrhea **rates** from 1992–1999 for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

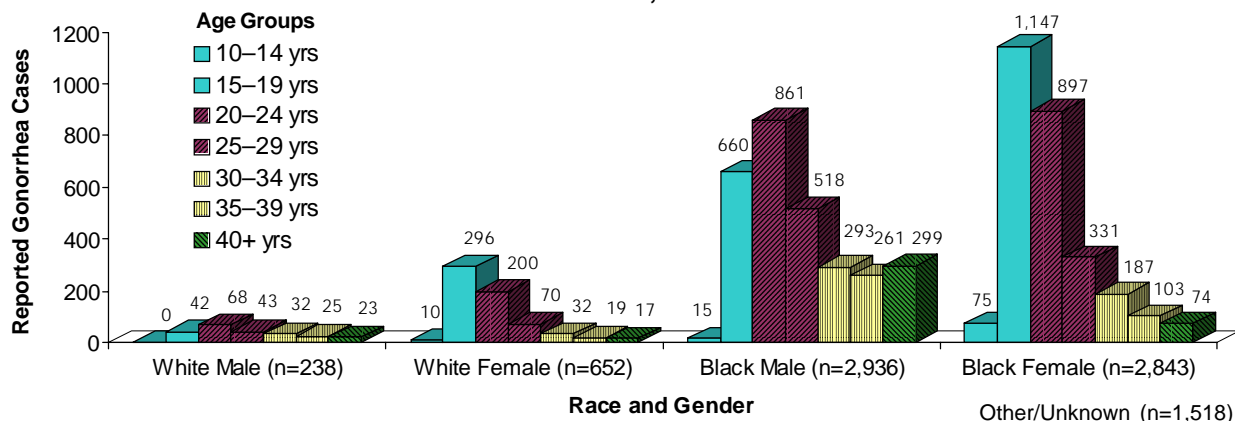
## Comment:

The number of gonorrhea cases reported in Missouri in 1999 decreased by 13.5 percent from the preceding year. However, the 8,187 cases reported in 1999 reflect the fact that gonococcal infection remains a very significant problem in the state. The true magnitude of the problem is even better understood when it is remembered that many infected persons are not diagnosed and reported because infection with *Neisseria gonorrhoeae*, especially in females, is often asymptomatic.

African Americans and teenagers (especially female teenagers), are very disproportionately represented among reported cases of gonorrhea. The highest rates of reported cases (as well as the largest numbers of cases) are from Missouri's two major metropolitan areas—St. Louis and Kansas City. However, gonorrhea cases were reported from 81 (71.1%) of the state's 114 counties (and St. Louis City) in 1999, indicating

(continued on page 6)

**Figure 1. Reported Gonorrhea Cases by Race, Gender and Age Group  
Missouri, 1999**

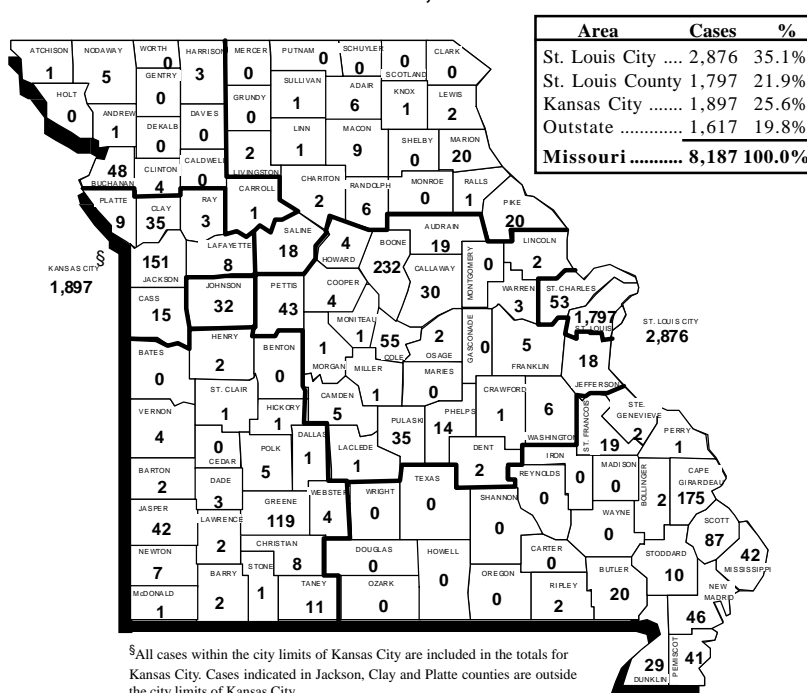


**Table 1. Reported Gonorrhea Cases and Rates by Geographic Area, Missouri, 1999**

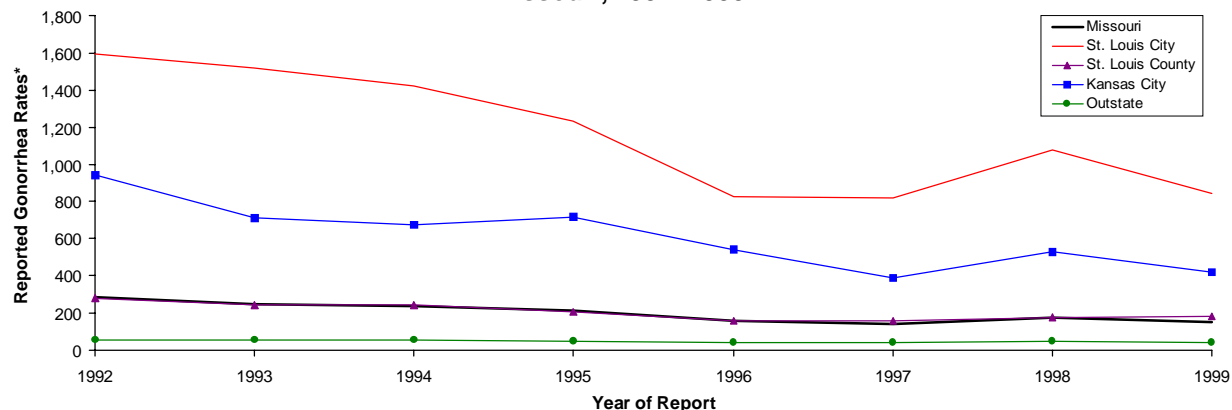
	Cases	%	Rate*
<b>Missouri</b>			
Whites .....	890	10.9%	18.8
Blacks .....	5,779	70.6%	943.1
Other/Unknown .....	1,518	18.5%	--
<b>Total Cases .....</b>	<b>8,187</b>	<b>100.0%</b>	<b>150.5</b>
<b>St. Louis City</b>			
Whites .....	77	2.7%	49.5
Blacks .....	2,266	78.8%	1,268.2
Other/Unknown .....	533	18.5%	--
<b>Total Cases .....</b>	<b>2,876</b>	<b>100.0%</b>	<b>847.6</b>
<b>St. Louis County</b>			
Whites .....	97	5.4%	11.9
Blacks .....	1,260	70.1%	768.2
Other/Unknown .....	440	24.5%	--
<b>Total Cases .....</b>	<b>1,797</b>	<b>100.0%</b>	<b>179.9</b>
<b>Kansas City</b>			
Whites .....	147	7.7%	49.0
Blacks .....	1,572	82.9%	1,181.7
Other/Unknown .....	178	9.4%	--
<b>Total Cases .....</b>	<b>1,897</b>	<b>100.0%</b>	<b>422.0</b>
<b>Outstate</b>			
Whites .....	569	35.2%	16.4
Blacks .....	681	42.1%	496.8
Other/Unknown .....	367	22.7%	--
<b>Total Cases .....</b>	<b>1,617</b>	<b>100.0%</b>	<b>44.3</b>

\*Per 100,000 population

**Figure 2. Reported Gonorrhea Cases by County  
Missouri, 1999**



**Figure 3. Reported Gonorrhea Rates by Geographic Area and Year of Report  
Missouri, 1992-1999**



(continued from page 4)  
the widespread distribution of the infection.

A summary of the main principles of managing gonorrhea in adults and adolescents is given on page 11.

### Primary and Secondary (P&S) Syphilis

During 1999, 96 cases of P&S syphilis were reported in Missouri residents. (An additional 99 cases of early latent [duration of <1 year] syphilis were reported during 1999.)

The rate of reported P&S syphilis cases in the state in 1999 was 1.8 per 100,000 population, which was slightly lower than the nationwide rate of 2.5. Missouri ranked 19th among the fifty states in rates of reported P&S syphilis cases in 1999.

Of the 96 P&S syphilis cases reported in 1999, 49.0 percent were in males and 51.0 percent were in females. Seventy-two cases (75.0%) were in African Americans, and 16 (16.7%) were in whites. For 8 (8.3%) cases, race was not indicated. Table 2 shows the numbers and percentages of reported P&S syphilis cases in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

African Americans are disproportionately represented among reported P&S syphilis cases. The rate of reported P&S syphilis cases in African Americans in 1999 was 11.7 and the rate in whites was 0.3, resulting in a ratio of African American to white rates of 35:1. However, this ratio is less than in recent years; five years previously (1994), it was 93:1. Table 2 shows the rates of reported P&S syphilis cases in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

The average age at time of diagnosis is higher for reported cases of P&S syphilis

\* All rates (except those for congenital syphilis cases) are per 100,000 population, using 1998 population estimates.

as compared to reported cases of chlamydia or gonorrhea. For reported cases of P&S syphilis in males during 1999, the largest proportion of cases (29.8%) were in the 40+ age group. For females, the largest proportion of cases (20.4%) were in the 20–24 year age group; however, 18.4 percent of all female cases were in women 30 years of age and older. Figure 4 shows the distribution of cases by age group for white males and females, and African American males and females.

Of the 96 P&S syphilis cases reported in 1999, 51 (53.1%) were from St. Louis City, followed by 18 (18.8%) from Outstate Missouri, 17 (17.7%) from St. Louis County, and 10 (10.4%) from Kansas City. Besides St. Louis City, cases were reported from only 11 (9.6%) of the state's 114 counties. Figure 5 shows the number of P&S syphilis cases reported from each county in 1999.

The highest rate of reported P&S syphilis cases in 1999 was in St. Louis City (15.0), followed by Kansas City (2.2), St. Louis County (1.7), and Outstate Missouri (0.7). St. Louis City ranked 8th among U.S. cities of >200,000 population in rates of reported P&S syphilis cases in 1999; Kansas City ranked 33rd.

Since 1993, when a syphilis outbreak in the St. Louis area was at its height, the number of annually reported cases of P&S syphilis in Missouri has been decreasing, although the rate of decrease has slowed during the past three years. The 96 cases reported in 1999 represented an 11.9 percent decline from the 109 cases reported in 1998.

From 1998 to 1999, reported cases of P&S syphilis decreased by 40 percent (from 30 to 18 cases) in the Outstate area. Reported cases from St. Louis County increased by 11.8 percent (from 15 to 17 cases); reported St. Louis City cases decreased by 12.1 percent (from 58 to 51 cases). Ten P&S syphilis cases were reported from Kansas City during 1999, compared with six the preceding year.

Trends over time in the **rates** of reported P&S syphilis cases parallel the trends in

the actual numbers of reported cases. Figure 6 shows trends in P&S syphilis **rates** from 1992–1999 for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

### Comment:

The annual number of P&S syphilis cases reported in Missouri continues to decline; the 96 cases reported in 1999 represent an 11.9 percent decrease from the 109 cases reported the previous year. African Americans continue to be very disproportionately affected by syphilis, and relatively few P&S syphilis cases are being reported in whites. The average age at time of diagnosis is higher for reported cases of P&S syphilis as compared to reported cases of chlamydia or gonorrhea, and a noticeable number of cases are seen in persons >35 years of age.

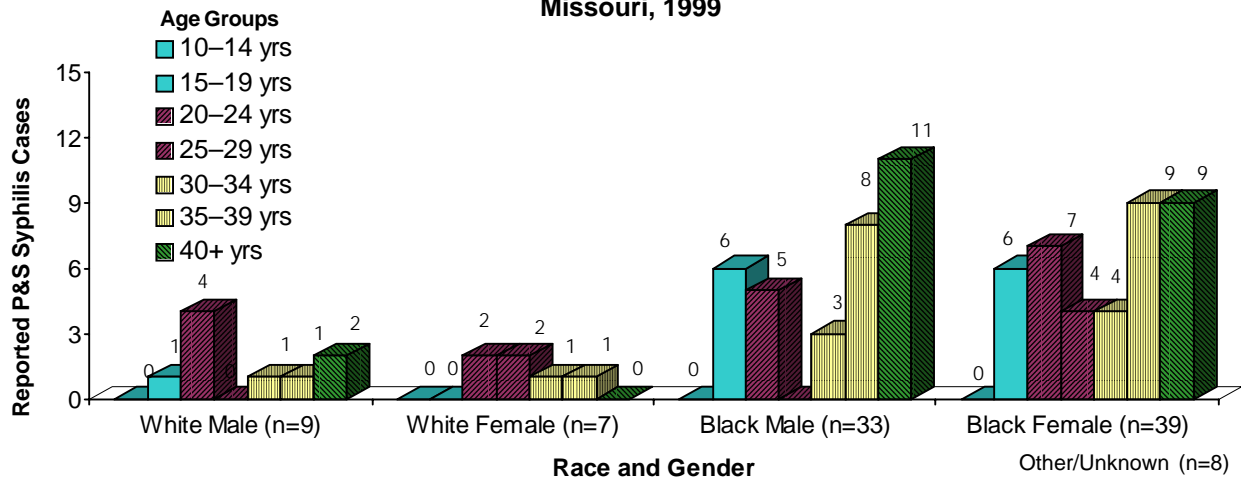
Syphilis infections primarily occur in certain core populations, which in Missouri in recent years have predominantly been located in the St. Louis area. The relatively limited geographic distribution of the disease in the state is indicated by the fact that only 11 (9.6%) of the state's 114 counties (and St. Louis City) reported P&S syphilis cases in 1999.

The number of reported cases of P&S syphilis in Missouri is small in comparison to other sexually transmitted diseases (STDs) such as gonorrhea and chlamydia. However, severe disease can result from untreated syphilis infection, and significant resources must be devoted to control of even a relatively few number of cases. The potential also remains for the recurrence of significant outbreaks of syphilis in the state.

The Missouri Department of Health's Section of STD/HIV/AIDS Prevention and Care Services has received a five-year Syphilis Elimination Grant focusing on eliminating syphilis in St. Louis City by 2005. Strategies being planned as part of this effort include (but are not limited to) enhanced syphilis screening

(continued on page 8)

**Figure 4. Reported P&S Syphilis Cases by Race, Gender and Age Group  
Missouri, 1999**

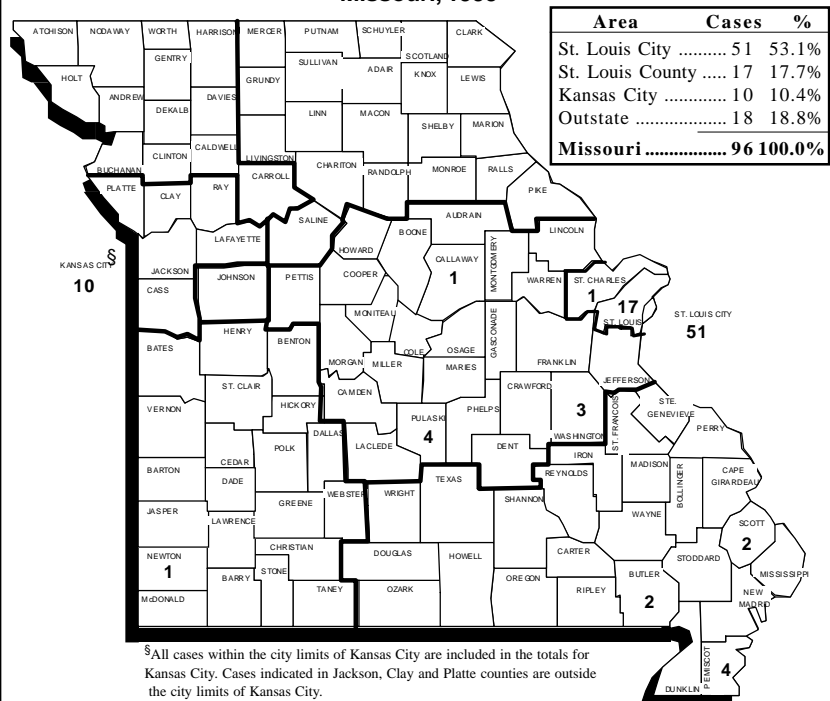


**Table 2. Reported P&S Syphilis Cases and Rates by Geographic Area, Missouri, 1999**

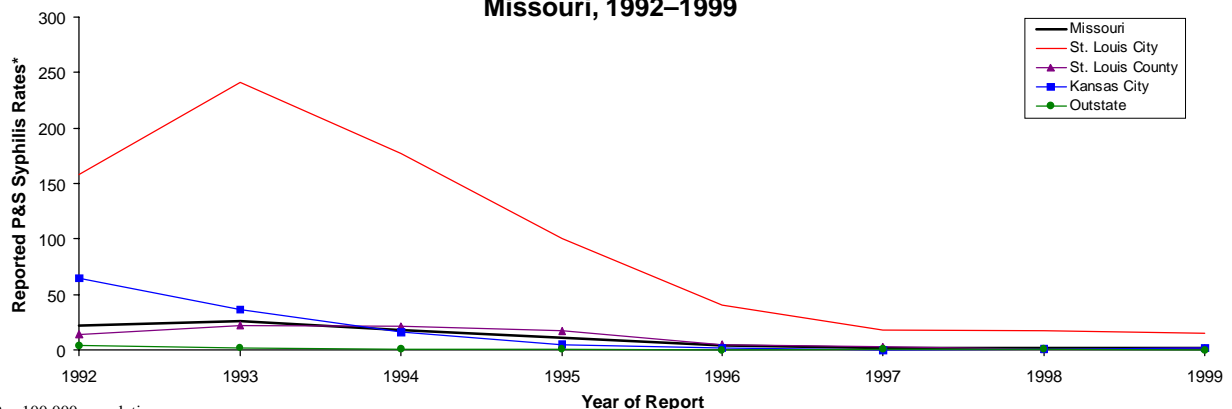
	Cases	%	Rate*
<b>Missouri</b>			
Whites .....	16	16.7%	0.3
Blacks .....	72	75.0%	11.7
Other/Unknown .....	8	8.3%	--
<b>Total Cases .....</b>	<b>96</b>	<b>100.0%</b>	<b>1.8</b>
<b>St. Louis City</b>			
Whites .....	1	2.0%	0.6
Blacks .....	46	90.2%	30.3
Other/Unknown .....	4	7.8%	--
<b>Total Cases .....</b>	<b>51</b>	<b>100.0%</b>	<b>15.0</b>
<b>St. Louis County</b>			
Whites .....	2	11.8%	0.2
Blacks .....	12	70.6%	7.3
Other/Unknown .....	3	17.6%	--
<b>Total Cases .....</b>	<b>17</b>	<b>100.0%</b>	<b>1.7</b>
<b>Kansas City</b>			
Whites .....	1	10.0%	0.1
Blacks .....	9	90.0%	5.4
Other/Unknown .....	0	0.0%	--
<b>Total Cases .....</b>	<b>10</b>	<b>100.0%</b>	<b>2.2</b>
<b>Outstate</b>			
Whites .....	12	66.7%	0.4
Blacks .....	5	27.8%	4.9
Other/Unknown .....	1	5.6%	--
<b>Total Cases .....</b>	<b>18</b>	<b>100.0%</b>	<b>0.7</b>

\*Per 100,000 population

**Figure 5. Reported P&S Syphilis Cases by County  
Missouri, 1999**



**Figure 6. Reported P&S Syphilis Rates by Geographic Area and Year of Report  
Missouri, 1992-1999**



\*Per 100,000 population

(continued from page 6)

in the St. Louis criminal justice system, along with increased screening at homeless shelters, and at street and community site locations. Screening at these locations, where persons at increased risk for syphilis may be found, can be an effective way to locate undiagnosed cases. In addition, the St. Louis City Department of Health and Hospitals has partnered with representatives from community organizations, drug treatment centers, correctional facilities and outreach workers to form a Community Syphilis Elimination Advisory Group (CSEAG) for the City of St. Louis. For more information on the grant, contact Amy Holterman at (800) 359-6259 or (573) 751-6141.

A summary of the main principles of managing P&S syphilis in adults and adolescents is given on page 12.

### **Congenital Syphilis**

Congenital syphilis is the result of transmission of *Treponema pallidum* from an infected mother to her infant during pregnancy or at the time of delivery. During 1999, 8 congenital syphilis cases were reported in the state; the corresponding rate\*\* was 10.6 cases per 100,000 live births.

During the preceding year, 1998, 20 cases of congenital syphilis were reported in Missouri, compared to 801 cases reported nationwide (most recent U.S. data). The rate of congenital syphilis cases in Missouri (27.0) in 1998 was higher than the nationwide rate (20.6).

African American infants are disproportionately represented among reported congenital syphilis cases. Of the 8 cases reported in 1999, 6 (75.0%) were in African American infants.

Of the 8 congenital syphilis cases reported in 1999, 4 (50.0%) were known to have been born to single (never married) mothers. Three (37.5%) of the 8

cases were known to have been born to mothers who received no prenatal care.

Of the 8 congenital syphilis cases reported in 1999, 4 (50.0%) were from St. Louis City, 2 (25.0%) from St. Louis County, 1 (12.5%) from Kansas City and 1 (12.5%) from Outstate Missouri.

In recent years, reported cases of congenital syphilis in Missouri peaked at 97 cases in 1993 (corresponding to the height of the syphilis outbreak in the St. Louis area), and then markedly declined to 12 cases in both 1996 and 1997. Reported cases increased to 20 cases in 1998, but then decreased by 60.0 percent to 8 cases in 1999.

### **Comment:**

In 1999, 8 cases of congenital syphilis were reported in Missouri, a 60.0% decrease from the 20 cases reported the preceding year. African American infants made up 6 (75.0%) of the 8 cases reported in 1999. Six (75.0%) of the 8 congenital syphilis cases reported in 1999 were from the St. Louis area.

A significant risk factor often associated with congenital syphilis cases is lack of, or inadequate, prenatal care by the mother. Adequate prenatal care, which includes syphilis testing, is vital to detecting and treating infection in pregnant women so that congenital syphilis in the infant can be prevented. Minimizing the number of new syphilis infections that occur in women of childbearing age and their sexual partners is another primary means of decreasing the risk of congenital syphilis in the community.

A summary of the main principles of managing syphilis during pregnancy is given on page 13.

### **Chlamydia**

During 1999, 13,355 cases of chlamydia were reported in Missouri residents. The rate of reported chlamydia cases in the

state in 1999 was 245.6 per 100,000 population, which was slightly less than the nationwide rate of 254.1. Missouri ranked 21st among the fifty states in rates of reported chlamydia cases in 1999.

Of total chlamydia cases reported in 1999, the vast majority were in females (86.2%). This reflects the selective screening of females for chlamydia undertaken by the Missouri Infertility Prevention Project (MIPP). If similar widespread screening of males were also undertaken, it is expected that the number of diagnosed and reported cases in males would be much higher than is currently seen.

Of the 13,355 cases of chlamydia reported in 1999, 5,291 (39.6%) cases were known to have occurred in African Americans, 3,517 (26.3%) in whites, 64 (0.4%) in Asians, and 12 (0.1%) in Native Americans; in addition, 150 (1.1%) cases were classified as Other Race. For 4,321 (32.4%) cases, race was not indicated. Table 3 shows the numbers and percentages of reported chlamydia cases in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri.

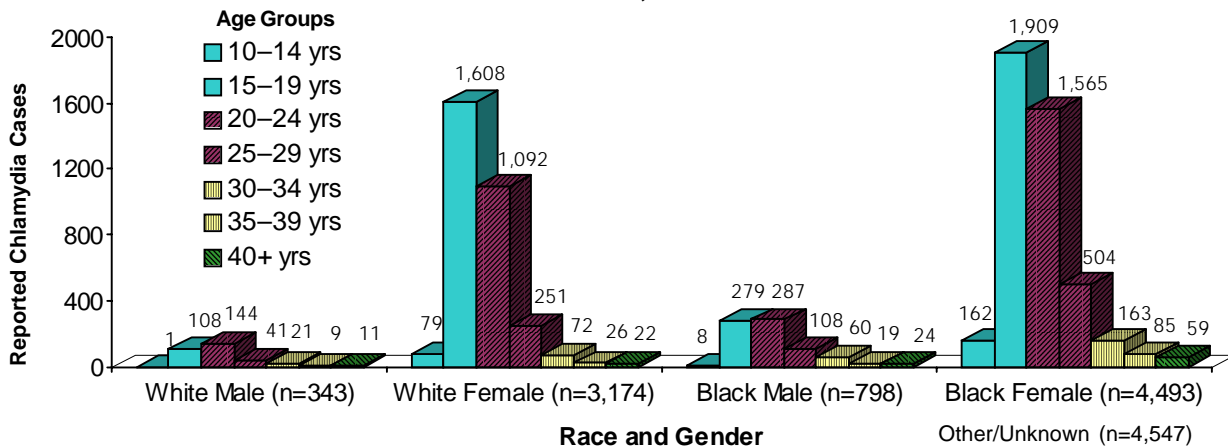
African Americans are disproportionately represented among reported chlamydia cases. Although African Americans make up about 11 percent of Missouri's population, they comprise at least 39.6 percent of total reported cases. (The percentage of reported cases which are actually African American is very likely higher since some of the large number of cases for whom race was not indicated are almost certainly African American.) Table 3 shows the rates of reported chlamydia cases in whites and African Americans for Missouri, St. Louis City and County, Kansas City, and Outstate Missouri (because almost one-third of reported cases did not have a race indicated, the rates shown will obviously be lower than would have been the case had the race been known for each case reported).

(continued on page 10)

\* All rates (except those for congenital syphilis cases) are per 100,000 population, using 1998 population estimates.

\*\* All rates for congenital syphilis cases are per 100,000 live births.

**Figure 7. Reported Chlamydia Cases by Race, Gender and Age Group  
Missouri, 1999**

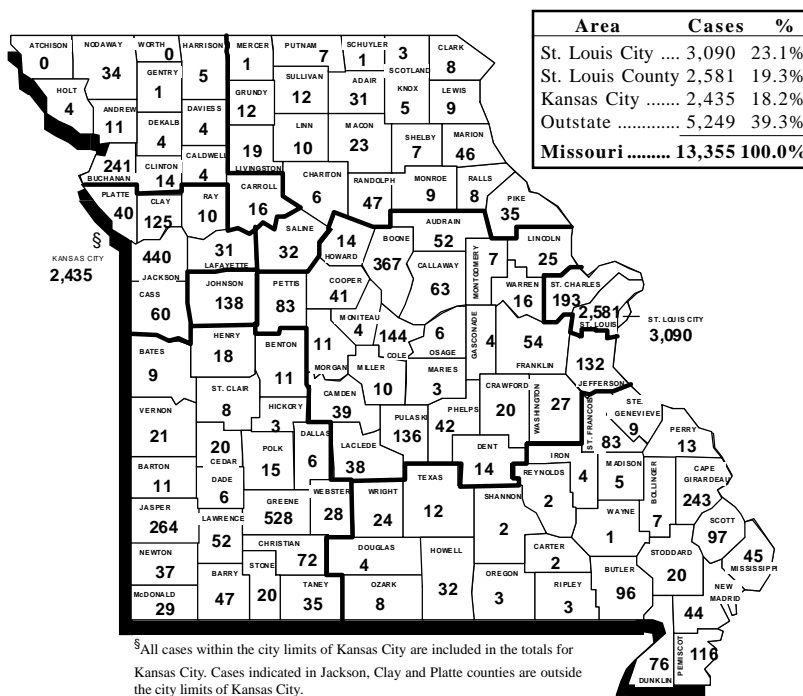


**Table 3. Reported Chlamydia Cases and Rates by Geographic Area, Missouri, 1999**

	Cases	%	Rate*
<b>Missouri</b>			
Whites .....	3,517	26.3%	74.1
Blacks .....	5,291	39.6%	863.4
Other/Unknown .....	4,547	34.0%	--
<b>Total Cases .....</b>	<b>13,355</b>	<b>100.0%</b>	<b>245.6</b>
<b>St. Louis City</b>			
Whites .....	118	3.8%	75.8
Blacks .....	1,933	62.6%	1,081.8
Other/Unknown .....	1,039	33.6%	--
<b>Total Cases .....</b>	<b>3,090</b>	<b>100.0%</b>	<b>910.7</b>
<b>St. Louis County</b>			
Whites .....	244	9.5%	30.0
Blacks .....	1,182	45.8%	720.7
Other/Unknown .....	1,155	44.8%	--
<b>Total Cases .....</b>	<b>2,581</b>	<b>100.0%</b>	<b>258.4</b>
<b>Kansas City</b>			
Whites .....	350	14.4%	116.6
Blacks .....	1,292	53.1%	971.2
Other/Unknown .....	793	32.6%	--
<b>Total Cases .....</b>	<b>2,435</b>	<b>100.0%</b>	<b>541.7</b>
<b>Outstate</b>			
Whites .....	2,805	53.4%	80.7
Blacks .....	884	16.8%	644.9
Other/Unknown .....	1,560	30.3%	--
<b>Total Cases .....</b>	<b>5,249</b>	<b>100.0%</b>	<b>143.8</b>

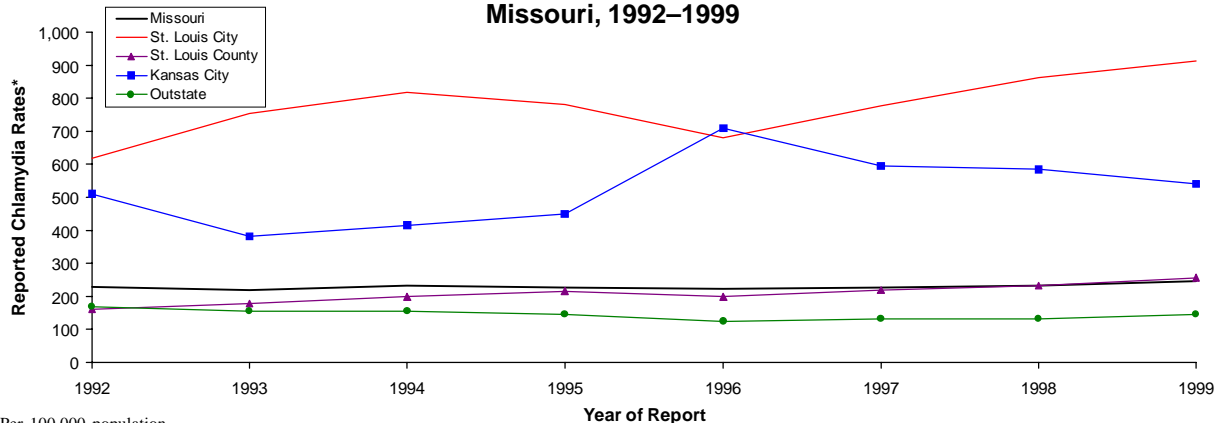
\*Per 100,000 population

**Figure 8. Reported Chlamydia Cases by County  
Missouri, 1999**



§All cases within the city limits of Kansas City are included in the totals for Kansas City. Cases indicated in Jackson, Clay and Platte counties are outside the city limits of Kansas City.

**Figure 9. Reported Chlamydia Rates by Geographic Area and Year of Report  
Missouri, 1992-1999**



\*Per 100,000 population

(continued from page 8)

In 1999, slightly over half of all reported chlamydia cases in females were in teenagers. Persons less than 20 years of age made up 47.1 percent of African American female cases and 53.9 percent of white female cases, but only 37.6 percent of African American male cases and 34.1 percent of white male cases. Figure 7 shows the distribution of cases by age group for white males and females, and African American males and females.

Of the 13,355 chlamydia cases reported in 1999, the largest number, 5,249 (39.3%) were from Outstate Missouri, followed by 3,090 (23.0%) from St. Louis City, 2,435 (18.2%) from Kansas City, and 2,581 (19.3%) from St. Louis County. Only two counties in Missouri did not report at least one chlamydia case in 1999. Figure 8 shows the number of chlamydia cases reported from each county in 1999.

The highest rate of reported cases in 1999 was in St. Louis City (910.7), followed by Kansas City (541.7), St. Louis County (258.4), and Outstate Missouri (143.8). St. Louis City ranked 2nd among U.S. cities of >200,000 population in rates of reported chlamydia cases in 1999; Kansas City ranked 12th.

In 1999, the 13,355 reported cases of chlamydia represented a 5.5 percent increase from the 12,655 cases reported in 1998.

From 1998 to 1999, reported cases of chlamydia in St. Louis City increased by 6.1 percent (from 2,911 to 3,090 cases); reported St. Louis County cases increased by 11.1 percent (from 2,324 to 2,581 cases); and reported Outstate cases increased by 9.3 percent (from 4,802 to 5,249 cases). Reported Kansas City cases decreased by 7.0 percent (from 2,618 to 2,435 cases).

Trends over time in the **rates** of reported chlamydia cases parallel the trends in the actual numbers of reported cases. Figure 9 shows trends in chlamydia **rates** from 1992–1999 for Missouri, St. Louis

City and County, Kansas City, and Outstate Missouri.

#### **Comment:**

Large numbers of Missourians are infected with *Chlamydia trachomatis* each year. Because of incomplete information, the race of approximately one-third of reported cases is not known. However, based on available data, it appears that African Americans in Missouri are disproportionately affected by chlamydia, although not to the extent seen with syphilis and gonorrhea. Chlamydia appears more widely distributed in the community than either syphilis or gonorrhea, and large numbers of chlamydia cases occur in whites as well as in African Americans. For all racial groups, the largest numbers of cases are reported from persons in their late teens and early twenties; among females, the 15–19 year old age group has the most reported cases.

In 1999, the highest rates of reported chlamydia cases were in St. Louis City, followed by Kansas City, St. Louis County, and Outstate Missouri. Only two Missouri counties did not report a chlamydia case in 1999.

The 13,355 cases of chlamydia reported in 1999 represented a 5.5 percent increase from the 12,655 cases reported in 1998. However, it is unclear whether this reflects an actual increase in the number of new infections, or an increase in the amount of testing of individuals at risk for chlamydial infection.

Chlamydial infection is the most common bacterial STD in the United States today, and a major cause of pelvic inflammatory disease, infertility, ectopic pregnancy, and chronic pelvic pain. The large numbers of *C. trachomatis* infections that are continuing to occur in Missouri, the insidious nature of the infection, and its potentially severe consequences (especially in women) are all reasons for concern.

Because chlamydial infection frequently occurs without symptoms, the disease is

often not diagnosed or, in some instances, not diagnosed until complications develop. Consequently, screening of persons at increased risk for *C. trachomatis* infection, such as young, sexually active women, is very important in finding infected persons so that they (and their sex partners) can be treated and further spread of infection halted, and so that, through the reporting of diagnosed cases to public health officials, the extent of infection in the population can be determined. The Centers for Disease Control and Prevention (CDC) has developed recommendations that call for screening of all sexually active females under 20 years of age at least annually, and annual screening of women ages 20 and older with one or more risk factors for chlamydia (i.e., new or multiple sex partners, or lack of consistent use of barrier contraception). All women with infection of the cervix and all pregnant women should be tested for chlamydial infection.<sup>1</sup> In addition, screening for *C. trachomatis* is now included as a HEDIS (Health Plan Employer Data and Information Set) 2000 measure. This HEDIS indicator measures the proportion of sexually active females between the ages of 15–25 who were screened for chlamydial infection annually.<sup>2</sup>

A summary of the main principles of managing chlamydia in adults and adolescents is given on page 14.

#### **Final Comments**

Medical providers should report, as required by Missouri law, all cases of chlamydial infection, gonorrhea, and syphilis to their local health department, or to the Missouri Department of Health's Office of Surveillance at (573) 751-9071.

STD education courses for physicians, other clinical providers, and laboratory staff are available through the St. Louis STD/HIV Prevention Training Center, Washington University School of Medicine. For more information, call (314) 747-0294 or 1522, or FAX (314)

(continued on page 23)

# Important Points in Managing Gonococcal Infection in Adolescents and Adults

## Information from CDC's 1998 Guidelines for Treatment of Sexually Transmitted Diseases<sup>1</sup>

### Dual Therapy for Gonococcal and Chlamydial Infections

Patients infected with *Neisseria gonorrhoeae* often are coinfecting with *Chlamydia trachomatis*; this finding led to the recommendation that patients treated for gonococcal infection also be treated routinely with a regimen effective against uncomplicated genital *C. trachomatis* infection. In geographic areas in which the rates of coinfection are low, some clinicians might prefer to test for chlamydia rather than treat presumptively. However, presumptive treatment is indicated for patients who may not return for test results.

### Recommended Treatment Regimens for Uncomplicated Gonococcal Infections of the Cervix, Urethra, and Rectum in Adolescents and Adults

Cefixime 400 mg orally in a single dose <b>OR</b> Ceftriaxone 125 mg IM in a single dose <b>OR</b> Ciprofloxacin 500 mg orally in a single dose <b>OR</b> Ofloxacin 400 mg orally in a single dose	<b>PLUS</b>	Azithromycin 1 g orally in a single dose, <b>OR</b> Doxycycline 100 mg orally twice a day for 7 days
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Alternative regimens are discussed in the CDC treatment guidelines.<sup>1</sup> Note that cefixime is **not** recommended if gonococcal infection of the pharynx is present.

### Travel History

[An increased prevalence of fluoroquinolone-resistant gonorrhea in Hawaii has recently been reported.<sup>2</sup> CDC now recommends that for patients with gonorrhea in the United States, travel history, including sex partner travel history, should be obtained. If patients or their sex partners are likely to have acquired gonococcal infections in Hawaii, the Pacific Islands, or Asia, they should not be treated with fluoroquinolone antimicrobials; instead, ceftriaxone or cefixime should be used. For those unable to tolerate a cephalosporin, spectinomycin should be used.<sup>2</sup>]

### Follow-Up

Patients who have uncomplicated gonorrhea and who are treated with any of the recommended regimens need not return for a test of cure. Patients who have symptoms that persist after treatment should be evaluated by culture for *N. gonorrhoeae*, and any gonococci isolated should be tested for antimicrobial susceptibility. Infections identified after treatment with one of the recommended regimens usually result from reinfection rather than treatment failure, indicating a need for improved patient education and referral of sex partners. Persistent urethritis, cervicitis, or proctitis also may be caused by *C. trachomatis* and other organisms.

### Management of Sex Partners

Patients should be instructed to refer sex partners for evaluation and treatment. [If providers have questions regarding partner elicitation/ notification, they can contact their local health department.] All sex partners of patients who have *N. gonorrhoeae* infection should be evaluated and treated for *N. gonorrhoeae* and *C. trachomatis* infections if their last sexual contact with the patient was within 60 days before onset of symptoms or diagnosis of infection in the patient. If a patient's last sexual intercourse was >60 days before onset of symptoms or diagnosis, the patient's most recent sex partner should be treated. Patients should be instructed to avoid sexual intercourse until therapy is completed and they and their sex partners no longer have symptoms.

### Allergy, Intolerance, or Adverse Reactions

Persons who cannot tolerate cephalosporins or quinolones should be treated with spectinomycin. Because spectinomycin is unreliable (i.e., only 52% effective) against pharyngeal infections, patients who have suspected or known pharyngeal infection should have a pharyngeal culture evaluated 3–5 days after treatment to verify eradication of infection.

### Pregnancy

Pregnant women should not be treated with quinolones or tetracyclines. Those infected with *N. gonorrhoeae* should be treated with a recommended or alternate cephalosporin. Women who cannot tolerate a cephalosporin should be administered a single 2-g dose of spectinomycin IM. Either erythromycin or amoxicillin is recommended for treatment of presumptive or diagnosed *C. trachomatis* infection during pregnancy. [See the CDC treatment guidelines<sup>1</sup> for more information.]

1. CDC. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47(No. RR-1):59–69.

[http://www.cdc.gov/nchstp/dstd/1998 STD\\_Guidelines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998 STD_Guidelines/1998_guidelines_for_the_treatment.htm)

2. CDC. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49(37):833–7.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4937a1.htm>

# Important Points in Managing Primary and Secondary Syphilis in Adults

## Information from CDC's 1998 Guidelines for Treatment of Sexually Transmitted Diseases<sup>1</sup>

### Recommended Treatment Regimen for Primary or Secondary Syphilis in Adults

Benzathine penicillin G 2.4 million units IM in a single dose.

NOTE: Recommendations for treating pregnant women are discussed on page 13. Recommendations for treating HIV-infected persons with syphilis, and for treating all persons with latent or tertiary syphilis, or with neurosyphilis, are discussed in the CDC treatment guidelines.<sup>1</sup>

### Recommended Treatment Regimen for Nonpregnant Penicillin-Allergic Adults Who Have Primary or Secondary Syphilis

Doxycycline 100 mg orally twice a day for 2 weeks,  
**OR**  
Tetracycline 500 mg orally four times a day for 2 weeks

Close follow-up of such patients is essential. There is less clinical experience with doxycycline than with tetracycline, but compliance is likely to be better with doxycycline. Alternative regimens are discussed in the CDC treatment guidelines.<sup>1</sup>

### Other Management Considerations

All patients who have syphilis should be tested for HIV infection. In geographic areas in which the prevalence of HIV is high, patients who have primary syphilis should be retested for HIV after 3 months if the first HIV test result was negative.

Patients who have syphilis and who also have symptoms or signs suggesting neurologic disease (e.g., meningitis) or ophthalmic disease (e.g., uveitis) should be evaluated fully for neurosyphilis and syphilitic eye disease; this evaluation should include CSF analysis and ocular slit-lamp examination. Such patients should be treated appropriately according to the results of this evaluation. Invasion of CSF by *Treponema pallidum* accompanied by CSF abnormalities is common among adults who have primary or secondary syphilis. However, neurosyphilis develops in only a few patients after treatment with the regimens described in this report. Therefore, unless clinical signs or symptoms of neurologic or ophthalmic involvement are present, lumbar puncture is not recommended for routine evaluation of patients who have primary or secondary syphilis.

### Follow-Up

Patients should be reexamined clinically and serologically at both 6 months and 12 months; more frequent evaluation may be prudent if follow-up is uncertain. Patients who have signs or symptoms that persist or recur or who have a sustained fourfold increase in nontreponemal test titer (i.e., in comparison with either the baseline titer or a subsequent result) probably failed treatment or were reinfected. These patients should be re-treated after reevaluation for HIV infection. Unless reinfection with *T. pallidum* is certain, a lumbar puncture also should be performed. Failure of nontreponemal test titers to decline fourfold within 6 months after therapy for primary or secondary syphilis identifies persons at risk for treatment failure. Such persons should be reevaluated for HIV infection. Optimal management of such patients is unclear. At a minimum, these patients should have additional clinical and serologic follow-up. HIV-infected patients should be evaluated more frequently (i.e., at 3-month intervals instead of 6-month intervals). If additional follow-up cannot be ensured, re-treatment is recommended. Some experts recommend CSF examination in such situations. When patients are re-treated, most experts recommend re-treatment with three weekly injections of benzathine penicillin G 2.4 million units IM, unless CSF examination indicates that neurosyphilis is present.

### Management of Sex Partners

Sexual transmission of *T. pallidum* occurs only when mucocutaneous syphilitic lesions are present; such manifestations are uncommon after the first year of infection. However, persons exposed sexually to a patient who has syphilis in any stage should be evaluated clinically and serologically according to the following recommendations:

- Persons who were exposed within the 90 days preceding the diagnosis of primary, secondary, or early latent syphilis in a sex partner might be infected even if seronegative; therefore, such persons should be treated presumptively.
- Persons who were exposed >90 days before the diagnosis of primary, secondary, or early latent syphilis in a sex partner should be treated presumptively if serologic test results are not available immediately and the opportunity for follow-up is uncertain.
- For purposes of partner notification and presumptive treatment of exposed sex partners, patients with syphilis of unknown duration who have high nontreponemal serologic test titers (i.e.,  $\geq 1:32$ ) may be considered as having early syphilis. However, serologic titers should not be used to differentiate early from late latent syphilis for the purpose of determining treatment.
- Long-term sex partners of patients who have late syphilis should be evaluated clinically and serologically for syphilis and treated on the basis of the findings of the evaluation.

The time periods before treatment used for identifying at-risk sex partners are a) 3 months plus duration of symptoms for primary syphilis, b) 6 months plus duration of symptoms for secondary syphilis, and c) 1 year for early latent syphilis.

1. CDC. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47(No. RR-1):28-49.  
[http://www.cdc.gov/nchstp/dstd/1998\\_STD\\_Guidelines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998_STD_Guidelines/1998_guidelines_for_the_treatment.htm)

# Important Points in Managing Syphilis During Pregnancy

## Information from CDC's 1998 Guidelines for Treatment of Sexually Transmitted Diseases<sup>1</sup>

All women should be screened serologically for syphilis during the early stages of pregnancy. In populations in which utilization of prenatal care is not optimal, RPR-card test screening and treatment (i.e., if the RPR-card test is reactive) should be performed at the time a pregnancy is diagnosed. For communities and populations in which the prevalence of syphilis is high or for patients at high risk, serologic testing should be performed twice during the third trimester, at 28 weeks of gestation and at delivery.

Earlier this year, the Missouri General Assembly passed legislation which makes changes to the statute (210.030, RSMo) pertaining to syphilis (and hepatitis B) testing of pregnant women. With these changes, **210.030, RSMo** now states that:

Every licensed physician, midwife, registered nurse and all persons who may undertake, in a professional way, the obstetrical and gynecological care of a pregnant woman in the state of Missouri shall, if the woman consents, take or cause to be taken a sample of venous blood of such woman at the time of the first prenatal examination, or not later than twenty days after the first prenatal examination, and subject such sample to an approved and standard serological test for syphilis, an approved serological test for hepatitis B and such other treatable diseases and metabolic disorders as are prescribed by the department of health. In any area of the state designated as a syphilis outbreak area by the department of health, if the mother consents, a sample of her venous blood shall be taken later in the course of pregnancy and at delivery for additional testing for syphilis as may be prescribed by the department.....

Any woman who delivers a stillborn infant after 20 weeks of gestation should be tested for syphilis. No infant should leave the hospital without the maternal serologic status having been determined at least once during pregnancy.

### Diagnostic Considerations

Seropositive pregnant women should be considered infected unless an adequate treatment history is documented clearly in the medical records and sequential serologic antibody titers have declined.

### Treatment

Penicillin is effective for preventing maternal transmission to the fetus and for treating fetal-established infection. Evidence is insufficient to determine whether the specific, recommended penicillin regimens are optimal.

### Recommended Regimens

Treatment during pregnancy should be the penicillin regimen appropriate for the stage of syphilis.

### Penicillin Allergy

There are no proven alternatives to penicillin for treatment of syphilis during pregnancy. Pregnant women who have a history of penicillin allergy should be de-sensitized and treated with penicillin. Skin testing may be helpful. [See the section on "Management of Patients Who Have a History of Penicillin Allergy" in the CDC treatment guidelines.<sup>1]</sup>

Tetracycline and doxycycline usually are not used during pregnancy. Erythromycin should not be used, because it does not reliably cure an infected fetus. Data are insufficient to recommend azithromycin or ceftriaxone.

### Other Management Considerations

Some experts recommend additional therapy in some settings. A second dose of benzathine penicillin 2.4 million units IM may be administered 1 week after the initial dose for women who have primary, secondary, or early latent syphilis. Ultrasonographic signs of fetal syphilis (i.e., hepatomegaly and hydrops) indicate a greater risk for fetal treatment failure; such cases should be managed in consultation with obstetric specialists.

Women treated for syphilis during the second half of pregnancy are at risk for premature labor and/or fetal distress if the treatment precipitates the Jarisch-Herxheimer reaction. These women should be advised to seek obstetric attention after treatment if they notice any contractions or decrease in fetal movements. Stillbirth is a rare complication of treatment, but concern for this complication should not delay necessary treatment. All patients who have syphilis should be offered testing for HIV infection.

### Follow-Up

Coordinated prenatal care and treatment follow-up are important, and syphilis case management may help facilitate prenatal enrollment. Serologic titers should be repeated in the third trimester and at delivery. Serologic titers may be checked monthly in women at high risk for reinfection or in geographic areas in which the prevalence of syphilis is high.

1. CDC. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47(No. RR-1): 28-49.  
[http://www.cdc.gov/nchstp/dstd/1998\\_STD\\_Guidelines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998_STD_Guidelines/1998_guidelines_for_the_treatment.htm)

# Important Points in Managing Chlamydial Infection in Adolescents and Adults

## Information from CDC's 1998 Guidelines for Treatment of Sexually Transmitted Diseases<sup>1</sup>

A recent investigation of patients in a health maintenance organization demonstrated that screening and treatment of [*Chlamydia trachomatis*] cervical infection can reduce the likelihood of pelvic inflammatory disease (PID). Treatment of infected patients prevents transmission to sex partners; and, for infected pregnant women, treatment might prevent transmission of *C. trachomatis* to infants during birth. Treatment of sex partners helps to prevent reinfection of the index patient and infection of other partners.

The following recommended treatment regimens and the alternative regimens cure infection and usually relieve symptoms.

### Recommended Treatment Regimens for Chlamydial Infection in Adolescents and Adults

Azithromycin 1 g orally in a single dose, <b>OR</b> Doxycycline 100 mg orally twice a day for 7 days
--

Alternative regimens are discussed in the CDC treatment guidelines.<sup>1</sup>

In populations with erratic health-care-seeking behavior, poor compliance with treatment, or minimal follow-up, azithromycin may be more cost-effective because it provides single-dose, directly observed therapy.

To maximize compliance with recommended therapies, medications for chlamydial infections should be dispensed on site, and the first dose should be directly observed.

### Follow-Up

Patients do not need to be retested for chlamydia after completing treatment with doxycycline or azithromycin unless symptoms persist or reinfection is suspected, because these therapies are highly efficacious.

Some studies have demonstrated high rates of infection among women retested several months after treatment, presumably because of reinfection. In some populations (e.g., adolescents), rescreening women several months after treatment might be effective for detecting further morbidity.

### Management of Sex Partners

Patients should be instructed to refer their sex partners for evaluation, testing, and treatment. Because exposure intervals have received limited evaluation, the following recommendations are somewhat arbitrary. Sex partners should be evaluated, tested, and treated if they had sexual contact with the patient during the 60 days preceding onset of symptoms in the patient or diagnosis of chlamydia. Health-care providers should treat the most recent sex partner even if the time of the last sexual contact was >60 days before onset or diagnosis.

Patients should be instructed to abstain from sexual intercourse until they and their sex partners have completed treatment. Because a microbiologic test of cure usually is not recommended, abstinence should be continued until therapy is completed (i.e., 7 days after a single-dose regimen or after completion of a 7-day regimen). Timely treatment of sex partners is essential for decreasing the risk for reinfecting the index patient.

### Pregnancy

Doxycycline and ofloxacin [which is one of the drugs in the alternative regimen for chlamydial infection] are contraindicated for pregnant women. The safety and efficacy of azithromycin use in pregnant and lactating women have not been established.

Either erythromycin or amoxicillin is recommended for treatment of presumptive or diagnosed *C. trachomatis* infection during pregnancy. [See the CDC treatment guidelines<sup>1</sup> for more information.] Repeat testing, preferably by culture, 3 weeks after completion of therapy with [these] regimens is recommended, because a) none of these regimens are highly efficacious and b) the frequent side effects of erythromycin might discourage patient compliance with this regimen. Erythromycin estolate is contraindicated during pregnancy because of drug-related hepatotoxicity.

1. CDC. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47(No. RR-1):53-59.  
[http://www.cdc.gov/nchstp/dstd/1998\\_STD\\_Guidlines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998_STD_Guidlines/1998_guidelines_for_the_treatment.htm)

# Psychological Effects of a Mass Casualty Incident

Marion Warwick, M.D., M.P.H.  
*Bioterrorism/Emergency Response Unit*

The potential for terrorism events to cause large numbers of victims, ranging in the thousands, is critical to appreciate and plan for. Discussion about biological terrorism lately has rightly been focused on the recognition and treatment of physical casualties, but we should also not neglect the profound effect that a mass casualty event would have on the psyche: of individuals, communities, and the nation. This article describes some ideas about what to expect regarding public reactions to a mass casualty event which were raised at a conference sponsored by the Armed Forces Radiobiology Research Institute in Bethesda, Maryland, July 25–27, 2000, entitled, “The Operational Impact of Psychological Casualties from Weapons of Mass Destruction.”

Judging from past occurrences of terrorist events, estimates vary from 4 to 20 psychological victims for every physical victim in a mass casualty event. In an example of the worst case, following a recent radiological event in Goiania, Brazil, in which 250 persons were actually exposed, 60,000 sought medical care and 5,000 had psychiatric symptoms, providing a 500 to 1 ratio of patients seen in the medical system to exposed victims (12.5% of the population were seen), and a 20 to 1 ratio of psychiatric to physical casualties.

Psychological effects can be described on a spectrum, from “worried well” (who can actually manifest real symptoms such as rashes, vomiting, etc.) to “shell shock” victims, who are literally incapacitated from psychological stress. Other syndromes include becoming accident-prone, developing unexplained physical symptoms, or behavioral and conduct disorders.

Some of the factors which have been associated with an increased number of psychiatric casualties are:

- The number of physical casualties (This is highly correlated with psychological victims. The greater the number of physical casualties, the greater the number of psychological casualties.)
- Lack of general knowledge about the cause
- Physical proximity to location of event
- Increased publicity and media coverage making it difficult to forget

Establishing trust with victims is of critical importance. Psychological victims can develop **real** physical symptoms for which the cause is not always readily distinguished. Even if a patient is clearly a psychological victim, it doesn't rule out the possibility they may have also been exposed to the agent. Each patient must be evaluated indi-

vidually and carefully. Patient's concerns must be taken seriously. If patients have to prove they are ill, they can't get well. Health care workers may also become psychological casualties.

Interventions include management of misattribution of physical symptoms, restoration of an effective social role, and return to usual sources of support. Constructive debriefing is an important part of prevention and treatment of psychiatric casualties. It needs to be carefully approached. At times, it may consist of groups sorting out what actually happened so that everyone gets the overall picture, not necessarily of individuals talking about their feelings.

A system for long term follow-up of patients is helpful. It is a way of saying to them: “We won't forget you.” Japan has instituted yearly physicals for those involved in the Sarin gas incident including education on post traumatic stress disorder, counseling, and support groups.

Behavioral health consequences will be the most widespread, the most long lasting, and the most expensive. A Psychological Impacts and Effects Course (PIE) is being developed through directed congressional appropriation.

## Additional Notes:

Further information and educational material regarding the management of chemical and biological agent casualties is available through the United States Army Medical Research Institute of Chemical Defense, Chemical Casualty Care Division's web site at <http://ccc.apgea.army.mil/>.

The Rhode Island Emergency Management Agency has developed a very extensive list of world wide web links that contain information on terrorism and biological warfare. The web page is located at <http://www.state.ri.us/riema/>

## Disease Reporting

Cases of reportable diseases and conditions should be reported promptly to your local health department, or to the Missouri Department of Health at

**(800) 392-0272**

(during working hours).

The emergency number is

**(573) 751-4674**

(for after hours, weekends or holidays).

# Hazardous Substances Emergency Events Surveillance 1999 Annual Report\*

Debby Hanlon  
Office of Surveillance

The Hazardous Substances Emergency Events Surveillance (HSEES) program, established by the federal Agency for Toxic Substances and Disease Registry (ATSDR) in 1990, collects information on the direct public health impact of emergency events involving hazardous substances. Missouri's HSEES program receives notifications of incidents involving hazardous substances from several sources, including the Missouri Department of Natural Resources' Environmental Services Program, the United States Coast Guard's National Response Center, the federal Department of Transportation's Hazardous Materials Information System, the Missouri State Highway Patrol, and the media. Additional information regarding releases is obtained from the Missouri Departments of Agriculture, Conservation, Public Safety and Transportation; local and regional environmental protection agencies; local public health agencies; first responders; incident commanders; individuals or businesses responsible for the spill; hospitals; employees; and witnesses and victims of hazardous substance emergency events.

The Missouri HSEES program has completed its sixth year of data collection. As the program continues, new notification and data sources are explored, and information is analyzed and shared to determine the public health impact of emergency events involving the release of hazardous substances in the state. All Missouri HSEES data is transferred to ATSDR through a web-based data entry system for analysis along with the data gathered from the other 14 participating states. Identifiers are encrypted upon transfer for confidentiality.

\* Data provided in this report for 1999 are preliminary. This report was supported by funds from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) trust fund provided to the Missouri Department of Health under Cooperative Agreement Number U61/ATU780955-06 from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

## Case Definition for Hazardous Substance Emergency Events

A hazardous substance release is entered in the HSEES system if it meets the following criteria:

1. An uncontrolled or illegal release or threatened release of one or more hazardous substances; and
2. The substances that are actually released or threatened to be released include ALL hazardous substances except petroleum products; and
3. The quantity of the hazardous substances that are released, or are threatened to be released, need (or would need) to be removed, cleaned up, or neutralized according to federal, state or local law; or
4. Only a threatened release of hazardous substances exists, but this threat leads to an action such as an evacuation that can potentially impact on the health of employees, responders or the general public. This action makes the event eligible for inclusion into the surveillance system even though the hazardous substances are not released.

Because the goal of the HSEES program is to reduce morbidity and mortality related to hazardous substances emergency events, it is important that the public, emergency responders, employees and industries receive information and feedback from the program concerning hazardous substance emergency events. In those cases where development of intervention strategies might prevent similar incidents, specific summary investigation reports are prepared and distributed to the community involved. Outreach activities are also conducted to promote prevention strategies and increase knowledge and awareness for industries, local emergency planning committees, emergency

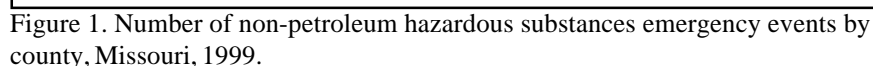
responders, health care providers and the general public.

## Analysis of Data on Hazardous Substances Emergency Events

During calendar year 1999, 291 incidents were reported in Missouri that met the hazardous substances emergency event case definition (see sidebar). All of these events involved actual releases of hazardous substances. Of the total number of events, 279 (95.9%) involved the release of only one substance, and 12 (4.1%) involved the release of two or more substances. The most commonly released substance was ammonia, occurring in 36 (12.4%) events.

Reported events were scattered throughout the state, occurring in 59 counties and the City of St. Louis. This represents 52.2 percent of the counties in the state.

A total of 23 (7.9%) events resulted in 71 victims sustaining single or multiple



injuries (112 total injuries). Thirteen fixed-facility events resulted in 50 victims, and 10 transportation events resulted in 21 victims. Table 1 illustrates the percentage of events with victims and number of victims by substance type. Some substance types, such as "Other inorganic substances", have a low percentage of events with victims, even

*(continued on page 18)*

(continued from page 17)

though these substances are more frequently released; however, two of the three events (66.7%) involving the release of chlorine had a total of 26 victims.

The most common types of injuries reported were respiratory irritation (39), eye irritation (29), trauma (13) and gastrointestinal symptoms (9). Injuries experienced also included chemical and thermal burns, skin irritation and headache. (See Figure 2.)

Of the 71 victims, 24 were employees, 7 were responders (police, fire, and emergency medical technician personnel), and 40 were members of the general public (including one student). Ten victims were treated at the scene of the event, 46 were treated at a hospital but were not admitted, 7 were treated at a hospital and admitted, 5 were taken to a hospital with symptoms and were observed (not admitted or treated), and 3 victims died.

The greatest number of injuries in a single event occurred when 1,000 pounds of chlorine gas were released as a cylinder was being loaded into a delivery truck by a crane and dropped to the ground. The gas began to leak when a seam ruptured, making it impossible to plug or patch. Two employees and 23 members of the general public who resided in the area suffered respiratory and eye irritation as a result of exposure. One victim was admitted to the hospital; the remaining 24 victims were treated and released. The cost for the HAZMAT team's response was estimated to be more than \$7,500.00. The cost to the facility in lost wages and productivity was not determined. In addition to the victims, approximately 150 individuals (employees and residents of the area) were evacuated and kept off their properties for seven hours, and a major highway was closed for five hours.

Three fatalities occurred in three separate events. Two deaths were transportation-related and one death occurred at a fixed facility. In the first transportation-related event, an individual was driving a car on

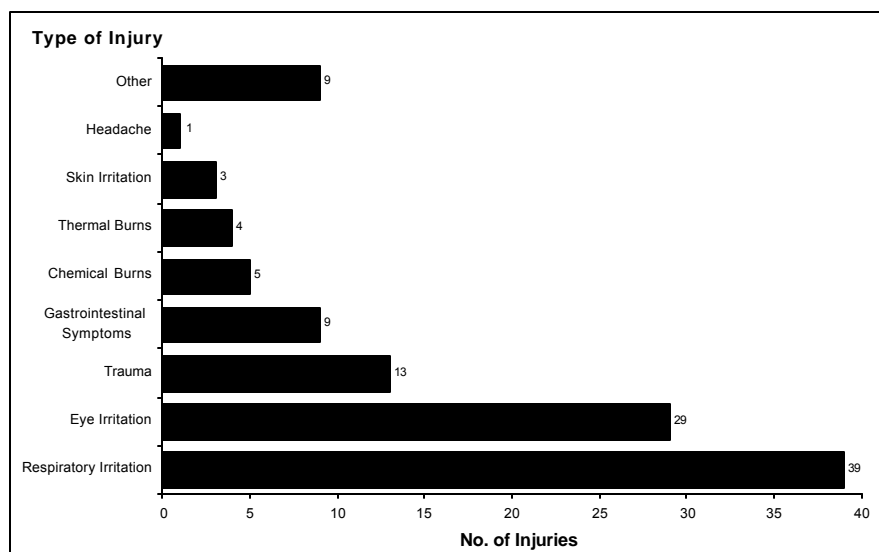


Figure 2. Number of injuries reported by type, Missouri HSEES, 1999.

an interstate highway. The passenger was holding a makeshift canister of anhydrous ammonia on his lap. The container exploded, resulting in the passenger's death. The driver suffered severe injuries and was hospitalized for seven days. One firefighter, one emergency medical technician and one individual from the general public, all of whom stopped to help, suffered from respiratory problems and inhalation burns. The cause of the smoke emanating from the car was not immediately known when these individuals pulled the driver and passenger away from the car. It is alleged that the ammonia was to be used for methamphetamine production.

The second transportation-related death occurred when a tanker trailer overturned and released six gallons of sodium hydroxide. The driver of the vehicle died from injuries sustained after being ejected from the vehicle.

The third fatality occurred in an explosion at a fireworks factory. One employee died from trauma and burns sustained during the explosion. Another employee, who was pregnant, suffered serious injuries and required an emergency Cesarean section.

Evacuations were ordered by an official in 30 (10.3%) events. Twenty-seven evacuations involved a total of 2,393 people. The number of people evacuated in three events is unknown. Sixteen

evacuations involved a building or an affected part of a building, six were within a specified radius of a release, four were downwind, two were both within a specified radius and downwind, and two were made with no defined criteria for the evacuated area.

One event involving the release of anhydrous ammonia had the largest number of people evacuated. An estimated 250 pounds of anhydrous ammonia were released due to a faulty valve at a chicken processing plant. Approximately 540 people at the facility and at a nearby campground were evacuated for two hours. The incident occurred at 3:00 a.m. on Memorial Day.

## Reporting Events

The Missouri HSEES program is indebted to the Missouri Department of Natural Resources' Environmental Services Program for helping to investigate these hazardous substances emergency events. The HSEES program relies heavily on this unit for notification of events and frequently contacts them for information regarding releases.

For additional information, please visit the HSEES web site at <http://www.health.state.mo.us/hsees> or contact: Debby Hanlon, HSEES Coordinator, Missouri Department of Health, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 526-1686.

## 1999 Outbreaks of Communicable Disease

(continued from page 3)

community outbreaks have been better reported than those occurring within health care facilities/institutions.

**Although recent medical literature suggests that today's health care environment of understaffing and sicker patients is resulting in an increase of clusters or outbreaks of disease, during 1999, only 31 nosocomial disease clusters or outbreaks were reported for Missouri.** The reported 31 disease outbreaks affected 964 individuals as compared to 45 nosocomial outbreaks affecting 941 persons in 1998. Table 2 categorizes these outbreaks by cause and number of cases.

Two methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks involved

multiple sites of infection. Strict attention to handwashing and the cohorting of infected persons were effective in stopping the further spread of MRSA.

An outbreak of Group A *Streptococcus* involved 20 children in a hospital pediatric unit over a period of several weeks. Pharyngeal swabs were obtained on all patients on the unit as well as all staff. Cultures were reported as negative for all staff. A child admitted for an allergic reaction to an antibiotic, with the antibiotic discontinued, was later found to be culture positive and was most likely the index case.


A facility's infection control nurse rapidly identified a cluster of five *Clostridium difficile* infections. Two of the five cases were identified as being infected at the time of admission. One case had been on long-term antibiotics and nosocomial spread to two other persons was evidenced. Rapid implementation of effective infection control

measures prevented an ongoing outbreak.


The outbreaks of influenza and influenza-like illnesses occurred largely in elderly persons with documented influenza vaccinations. Hospitalizations were minimal with the exception of one outbreak that affected five persons in a group home. All five of these individuals required hospitalization and one died.


Two Norwalk-like viral outbreaks of acute gastrointestinal illness were also identified. These two outbreaks resulted in 50 percent of care receivers becoming ill and 20 percent of health care givers reporting illness in each facility. Strict handwashing by both care receivers and care givers as well as cohorting of the ill did little to stem the spread of this rapidly transmissible infection in either facility. Wearing of masks to empty emesis basins and to flush diarrhea stool did not occur until late into the outbreak, but may be the key to stopping the spread of this virus to others.

## LATE BREAKERS

 **Addition to Gonorrhea Treatment Recommendations:** An increased prevalence of fluoroquinolone-resistant gonorrhea in Hawaii has recently been reported. CDC now recommends that for all patients diagnosed with gonorrhea in the United States, a travel history, including sex partner(s) travel history, should be obtained. If patients or their sex partners are likely to have acquired gonococcal infections in Hawaii, the Pacific Islands, or Asia, they should not be treated with fluoroquinolone antimicrobials; instead, ceftriaxone or cefixime should be used. (See page 11 for recommended treatment regimens.) For those unable to tolerate a cephalosporin, spectinomycin should be used.

Source: CDC. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49(37):833-7.

 **High Blood Pressure Web Page:** The National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health and its National High Blood Pressure Education Program have launched a high blood pressure web page. This web page is designed as a resource for the general public, physicians, community organizations, the media and other health care professionals. The web page is part of NHLBI's web site and can be found at <http://www.nhlbi.nih.gov/hbp/index.html>. If you would like additional information on high blood pressure resources, please contact the Missouri Cardiovascular Health Program at (800) 316-0935.

 **Missouri Department of Health State Public Health Laboratory Web Page:** This web page can be accessed using the pull down menu on the Department of Health home page at <http://www.health.state.mo.us>, or directly at <http://www.health.state.mo.us/Lab/index.htm>. The web page contains information regarding the various tests available through the State Public Health Laboratory, and includes instructions for collecting and submitting specimens as well as phone numbers to call with questions.

# 1999–2000 Influenza Season: Greene County, Missouri

Nancy S. Hoeman, M.S., R.N.

Lester L. Cox College of Nursing and Health Sciences

Kevin S. Gipson, B.A.

William “Clay” Goddard, M.P.A.

Barbara Hunter, R.N., B.S.N., C.I.C.

Springfield-Greene County Health Department

## Introduction

Influenza epidemics occur in the United States virtually every year during winter months, accounting for substantial morbidity and mortality, including an average of 114,000 hospitalizations and 20,000 deaths annually.<sup>1</sup> This report summarizes influenza data from Greene County, Missouri, collected during the 1999–2000 influenza season.

A variety of factors may have contributed to a perception that the 1999–2000 influenza season was particularly severe.<sup>2</sup> Outbreaks of influenza-like illnesses resulted in high frequencies of visits to physicians’ offices and emergency rooms, and in hospital admissions. The advent and marketing of two new prescription anti-influenza drugs possibly influenced care-seeking behavior of patients.<sup>3–4</sup> Many hospitals in Missouri reached maximum capacity requiring diversion of patients to other facilities, prompting an informational release in early January by Dr. Maureen Dempsey, Director of the Missouri Department of Health, advising citizens

on proper use of emergency rooms and other medical facilities.

This study was initiated in January 2000, to provide a descriptive analysis of the influenza season, defined as October 1, 1999–April 30, 2000, in Greene County, Missouri. Three major sources of information for the report include routine surveillance data collected by the Springfield-Greene County Health Department, pneumonia and influenza mortality data for the past five influenza seasons, and a survey of Greene County primary care physicians and nursing homes conducted during April and May 2000.

## 1999–2000 Influenza Season

The first laboratory-confirmed case of influenza for the 1999–2000 influenza season in Missouri was reported on October 12, 1999, approximately one month earlier than in previous years. This was a type A strain, which occurred in a 13-year-old Greene County female. Sporadic cases appeared in Greene County until late December, when an increase in influenza activity was noted. For the week ending January 7, 2000, there were 45 confirmed cases of type A influenza. During a three-day period from January 3–5, 2000, health care facilities in Springfield reported a total of 203 cases of influenza-like illnesses not confirmed by laboratory testing. A press briefing was held on January 7, 2000, coordinated by the Springfield-Greene

County Health Department with representatives from Cox Health Systems and St. John’s Health System, to inform the public of preventive measures for influenza and signs/symptoms warranting medical attention. Similar information was disseminated through a telephone “influenza hotline” and the Health Department web site.

By the week ending January 21, 2000, the Springfield-Greene County Health Department had received reports of 170 laboratory-confirmed cases of influenza; one additional case was reported by March 3, 2000. All 171 cases reported during the season from October 1, 1999 through April 30, 2000 were type A influenza, and all cases for which viral subtypes were available were A(H3N2) viruses. Laboratory testing for 154 (91.1%) cases was performed by rapid assay, and viral cultures were obtained on 17 (9.1%) cases. Examination of demographic characteristics of confirmed cases revealed an age range of 13 days to 95 years, with 87 cases (51%) occurring in individuals from birth to 19 years, and 24 cases (14%) in persons 65 years and older. The mean age of confirmed cases was 27.1 years, and median age 45 years.

In comparison, during the 1998–1999 influenza season, a total of 85 laboratory-confirmed case reports were received by the Springfield-Greene County Health Department, of which 82 were type A and 3 were type B. The laboratory-confirmed

**Table 1. Pneumonia and Influenza (P&I) Mortality by Influenza Season, Greene County, Missouri, October 1, 1999–April 30, 2000.**

Year	P&I Deaths	Mean Age (years)	Median Age (years)	Age Range	Total Deaths in Time Period	Percent P&I Cause-Specific Deaths
1995–1996	100	75.0	82	1 day–94 yr	2,010	4.98%
1996–1997	130	74.9	80	1 day–99 yr	2,075	6.27 %
1997–1998	150	81.1	84	9 yr–100 yr	2,144	7.00%
1998–1999	121	81.3	83	32 yr–102 yr	2,041	5.93 %
1999–2000	109	78.3	82	30 yr–100 yr	2,122	5.14 %

case rate was 74.6 per 100,000 population for the 1999–2000 season, in contrast to 37.44 per 100,000 population for the 1998–1999 season. The 1998–1999 influenza season was more representative of patterns seen in past seasons, with only three weeks in which more than ten laboratory-confirmed cases were reported and peak activity occurred in weeks 8 to 10 (weeks ending February 25 and March 25). During the 1999–2000 season, more than ten laboratory-confirmed cases were reported per week for seven consecutive weeks, beginning in early December and ending in late January.

Since laboratory confirmation of influenza is performed on only a small proportion of cases of influenza and influenza-like illness, a more reliable indicator of the severity of an influenza season is mortality due to pneumonia and influenza, which are reported as one category. Death certificates for all deaths in Greene County with pneumonia and influenza as primary cause of death were reviewed for a five-year period, beginning with the 1995–96 influenza season. The case definition for pneumonia includes viral pneumonia; pneumococcal and other bacterial pneumonia; bronchopneumonia, organism unspecified; and pneumonia due to other and unspecified organism. Pneumonia and influenza deaths during the 1999–2000 influenza season numbered 109; pneumonia and influenza deaths during the past five influenza seasons ranged from 100–150 per year. (See Table 1.)

While the number of laboratory-confirmed cases of influenza was considerably greater during the 1999–2000 influenza season than in 1998–1999, total deaths from pneumonia and influenza and the cause-specific death rate were lower than the previous three years. The percent of pneumonia and influenza cause-specific deaths for the 1999–2000 season (5.14%) was lower than the five-year mean percent for cause-specific deaths (5.86%). This difference may be attributable to varied factors, necessitating caution in interpretation. Several variables influence the reporting of laboratory-confirmed influenza cases,

**Table 2. Number and Percentage of Respondents Who Obtain Laboratory Confirmation in 0%, 1–25%, 26–50%, 51–75%, and 76–100% of Their Patients With Influenza-Like Illness, Greene County, Missouri, October 1, 1999–April 30, 2000.**

<u>Percentage of Cases of Influenza-Like Illness Which Received Laboratory Confirmation</u>	<u>Respondents</u>	
	<u>Number</u>	<u>Percent</u>
None (0%)	31	33.7%
1–25%	54	58.7%
26–50%	2	2.2%
51–75%	2	2.2%
76–100%	2	2.2%
No Response	1	1.1%
<b>Total</b>	<b>92</b>	<b>100.0%</b>

including care seeking by patients, and medical decisions to perform laboratory testing in order to confirm a diagnosis or to prescribe specific anti-viral therapy. Mortality data are consistently reported and provide a basis for comparison with previous years.

### Survey of Primary Care Providers

In order to supplement influenza morbidity and mortality data obtained through routine surveillance mechanisms, a survey of Greene County primary care physicians and nursing homes was conducted in April and May 2000. The purpose of the survey was to gather information from providers to assist in evaluation of the severity of the influenza season, and to describe diagnostic practices and use of anti-viral drug therapy, which may have affected the number of confirmed cases reported. The survey was mailed to a convenience sample of primary care physicians in the specialties of family practice, internal medicine, pediatrics, and geriatrics, and to nursing homes in Greene County. Of 224 surveys distributed, 92 (41%) were returned, with the following distribution by specialty: family practice 41 (44.6%), internal medicine 25 (27.2%), pediatrics 14 (15.2%), geriatrics 8 (4.3%) and nursing homes 4 (8.7%). Because of the small number of respondents in some groups, the analysis of survey results was limited to descriptive statistics.

Providers were asked to rate the severity of the 1999–2000 influenza season on a five-point Likert scale comparing the

number of cases of influenza-like illness seen in past seasons. Of the surveys returned, 62 percent rated the 1999–2000 influenza season as much worse or somewhat worse than past seasons, 25 percent about the same as past seasons, and 12 percent as somewhat better or much better than past seasons.

To describe patterns in use of laboratory testing for diagnosis, respondents were asked the proportion of influenza-like illnesses for which laboratory confirmation was obtained, the method of laboratory testing utilized, and the primary use of laboratory confirmation for viral respiratory illness (confirm diagnosis for specific anti-viral therapy; rule out other viral illnesses, including respiratory syncytial virus (RSV); rule out bacterial illness, including pneumonia; or did not obtain laboratory confirmation).

Laboratory testing for confirmation of influenza was not used for the majority of cases seen by responding providers. Of the 92 respondents, 85 (92.4%) obtained laboratory confirmation on 25 percent or fewer of cases, including 31 (33.7%) who reported that laboratory testing was not obtained on any patient, and 54 (58.7%) who reported obtaining laboratory confirmation on 1–25 percent. (See Table 2.) Some providers wrote comments on the survey indicating specific patterns of diagnostic testing, such as at the beginning of the season to confirm the presence of influenza.

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The predominant method of laboratory confirmation utilized was rapid assay, reported by 42 (45.7%) respondents. Viral cultures were obtained by 11 (12.8%) providers, and use of both tests was reported by 4 (4.3%). A total of 26 providers (28.3%) reported that no laboratory testing was ordered. The primary use of laboratory diagnostic testing was to confirm the diagnosis of influenza for specific anti-viral therapy, comprising 39.1 percent of the responses from those providers who utilized confirmatory testing.

Respondents were asked to indicate the proportion of their patients with “flu-like” viral respiratory illnesses who were treated with anti-viral drugs. Of the 92 respondents:

- 4 (4.3%) reported that none of their patients with influenza-like illness were given anti-viral drugs
- 38 (41.3%) reported that 1–20 percent of such patients were given anti-viral drugs
- 22 (23.9%) reported that 21–40 percent of such patients were given anti-viral drugs
- 10 (10.9%) reported that 41–60 percent of such patients were given anti-viral drugs
- 17 (18.5%) reported that >60 percent of such patients were given anti-viral drugs
- 1 (1.1%) did not respond to the question

To identify patterns in the use of specific anti-viral drug therapy for treatment of influenza, the survey included a fixed-choice item asking respondents to indicate whether drug therapy was not used, was used for treatment of influenza with laboratory confirmation, or was used for treatment without laboratory confirmation. Drug therapy for prophylaxis of influenza was not included, because utilization for this indication is less likely to affect the number of laboratory-confirmed cases reported, and because the newly released agents zanamivir (Relenza) and oseltamivir (Tamiflu) are not approved for influenza prophylaxis.

**Table 3. Anti-Viral Drugs Most Often Prescribed for Viral Respiratory Illness (n=92), Greene County, Missouri, October 1, 1999–April 30, 2000**

<u>Drug</u>	<u>Number of Responses</u>	<u>Percent of Responses</u>
Amantadine (Symmetrel)	15	16.3%
Rimantadine (Flumadine)	26	28.3%
Zanamivir (Relenza)	16	17.4%
Oseltamivir (Tamiflu)	25	27.2%
Multiple agents	4	4.3%
No response	6	6.5%

The majority of providers responding to the survey (63%) used anti-viral drugs for treatment of influenza without laboratory confirmation. Treatment of influenza with laboratory confirmation was reported by 14.1 percent, and ten respondents (10.9%) indicated that they prescribe anti-viral therapy both with and without lab confirmation. Nine providers (9.8%) indicated that they do not prescribe anti-viral agents for influenza.

The anti-viral drugs most often used during the 1999–2000 influenza season by providers who prescribed these agents were rimantadine (Flumadine) 28.3 percent and oseltamivir (Tamiflu) 27.2 percent. Amantadine (Symmetrel) was used by 16.3 percent, and zanamivir (Relenza) by 17.4 percent of prescribing providers. (See Table 3.) No differences were found in the utilization of the older agents amantadine and rimantadine (44.6%) as compared to the newly released zanamivir and oseltamivir (44.6%).

## Results

Analysis of available data supports the conclusion that influenza activity in Greene County, Missouri during the 1999–2000 influenza season began and peaked early, with most activity occurring in a brief period of time from late December to early January. Factors that may have contributed to an increased number of laboratory-confirmed cases of influenza included publicity and public education campaigns which may have resulted in more patients seeking care in physicians’ offices and emergency

rooms, and the availability of new anti-viral drugs which may have led to increased diagnostic testing. It is noted that a small proportion of “flu-like” illnesses were laboratory-confirmed, with 92 percent of providers surveyed reporting laboratory testing of 25 percent or fewer of cases. Only one of the 171 laboratory-confirmed cases occurred after the third week in January, indicating that combined public and private health care systems’ efforts to educate the public on prevention was successful in reducing the number of influenza cases after the initial outbreak.

The true measure of the severity of any influenza season is related mortality. The severity of this influenza season in terms of pneumonia and influenza deaths was actually less than the five-year mean. This may be due in part to a greater number of high-risk individuals receiving influenza vaccine coupled with more physicians prescribing new anti-viral drugs. Based on the available data it appears that the 1999–2000 influenza season was not an extraordinarily severe season even though it was earlier than most years. This season was different, in that the majority of cases were seen during a three-week period shortly after the Christmas holiday. This may have given practitioners an impression that this was a severe season based on the number of cases observed during this short period of time. The unique nature of this season as described by the short, yet intense duration demonstrates the need for a community-wide effort to prepare for the possible debilitating effects of an influenza epidemic.

Appreciation is expressed to these individuals, who assisted in the development of the provider survey: Jim Blaine, M.D., Janie Vestal, M.D., Amy Slagle, M.D., and Kay Libbus, Dr.P.H., R.N.; and to the Greene County physicians and nursing homes who responded to the questionnaire.

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2. Kansas City Health Department, Division of Communicable Disease Control. Next season's flu vaccine. *Community and Hospital Letter* 2000;20(9):2–3.
3. Baveley A. Flu mania strikes: People flock to doctors to get new medicines. *The Kansas City Star*, January 14, 2000:B1.
4. VandeWater J. Officials report widespread flu outbreak: Two new drugs can help with symptoms. *St. Louis Post-Dispatch*, January 6, 2000:B1.

## Recommendations for Sub-Saharan African Immigrants/Refugees

(continued from page 1)

Preventable and Tuberculosis Disease Elimination at (573) 751-6122 or (800) 611-2912. If you have questions regarding HIV counseling and testing, please contact the MDOH's Section of STD/HIV/AIDS Prevention and Care Services at (573) 751-6439 or (800) 359-6259. For general questions regarding these recommendations, please call the Office of Epidemiology at (573) 751-6128.

A particularly good source for information on TB testing, diagnosis, and management is CDC's *Core Curriculum on Tuberculosis* (4th Edition, 2000), which is available at <http://www.cdc.gov/nchstp/tb/>.

## Sexually Transmitted Diseases in Missouri: 1999

(continued from page 10)

362-1872, Email at [std/hiv@im.wustl.edu](mailto:std/hiv@im.wustl.edu), or visit their web site at: [http://www.umsi.edu/services/itc/std\\_ptc.html](http://www.umsi.edu/services/itc/std_ptc.html).

Recommendations from CDC for the treatment and prevention of sexually transmitted diseases were updated in 1998 (CDC. 1998 Guidelines for Treatment of Sexually Transmitted Diseases, *MMWR* 1998;47[No. RR-1]). These guidelines are available at: [http://www.cdc.gov/nchstp/dstd/1998\\_STD\\_Guidelines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998_STD_Guidelines/1998_guidelines_for_the_treatment.htm). Additional recommendations relative to treatment of gonorrhea are contained in a recent *MMWR* article<sup>3</sup>, and are also included in the summary of gonorrhea treatment on page 11.

A number of links to STD-related web sites are available on the Missouri Department of Health Home Page at: <http://www.health.state.mo.us/GLRequest/ID/LinksSTD.html>.

#### REFERENCES:

1. CDC. *Some Facts About Chlamydia*.

[http://www.cdc.gov/nchstp/dstd/Fact\\_Sheets/chlamydia\\_facts.htm](http://www.cdc.gov/nchstp/dstd/Fact_Sheets/chlamydia_facts.htm)

See also: CDC. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47(No. RR-1):53–59.

[http://www.cdc.gov/nchstp/dstd/1998\\_STD\\_Guidelines/1998\\_guidelines\\_for\\_the\\_treatment.htm](http://www.cdc.gov/nchstp/dstd/1998_STD_Guidelines/1998_guidelines_for_the_treatment.htm)

2. CDC. *An Open Letter to Health Care Providers: Take Action on HEDIS*. [http://www.cdc.gov/nchstp/dstd/Reports\\_Publications/HMOletter.pdf](http://www.cdc.gov/nchstp/dstd/Reports_Publications/HMOletter.pdf)

HEDIS is a set of standardized performance measures designed to ensure that purchasers and consumers have the information they need to reliably compare the performance of managed health care plans. For more information, see the following web sites:

<http://www.cdc.gov/nchstp/dstd/HEDIS.htm>

<http://www.ncqa.org/Pages/Programs/HEDIS/index.htm>

3. CDC. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49(37):833–7.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4937a1.htm>

The Department of Health web site has recently undergone changes to make it more user friendly. Electronic copies of the *Missouri Epidemiologist* can now be found under "News," or you can directly access issues of this newsletter at <http://www.health.state.mo.us/MoEpi/MoEpi.html>.

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Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

## **Centers for Disease Control and Prevention (CDC) Launches Internet Site in Spanish**

CDC has launched its Spanish language web site, CDC En Español, on the World-Wide Web at <http://www.cdc.gov/spanish/>. It is also accessible from the left navigation side bar of the CDC home page.

CDC En Español is not a translation of the English language web site but is a site tailored to Hispanic/Latino populations. It provides health-related information to the Hispanic/Latino professional and to the Spanish-speaking community. The site also includes information directed at special groups, such as adolescents, students, teachers, patients, health-care providers, women, and men.

Included is information from CDC and Agency for Toxic Substances and Disease Registry (ATSDR) centers, institutes, and offices and appropriate links to other key federal agency web sites that are important to the Hispanic/Latino community. CDC En Español provides an opportunity for CDC/ATSDR and its national and international partners to access common information and discuss issues.

Questions related to CDC En Español can be sent by e-mail to [spanish@cdc.gov](mailto:spanish@cdc.gov).



# EPIDEMIOLOGIST

Volume 22, Number 6

November–December 2000

## Survey to Assess Status of Hepatitis B Tracking Policies and Reinstitution of Birth Dose of Hepatitis B Vaccine in Missouri Obstetrical Hospitals - 2000

Ruby McPherson  
Section of Vaccine-Preventable and  
Tuberculosis Disease Elimination

### Case Study<sup>1</sup>

On December 13, 1999, a previously healthy 3-month-old infant of Southeast Asian descent was brought to a local Michigan hospital emergency department and was admitted following a five-day history of fever, diarrhea, and jaundice.

Upon admission to the hospital, hepatitis B serology was obtained along with liver function tests and liver enzymes. Laboratory results revealed that the infant was hepatitis B surface antigen (HBsAg) positive and IgM core antibody positive with elevated liver enzymes. The infant's test results were reported to the local health department on December 14, 1999. The infant's mother was tested at the same time and was found to be HBsAg positive and anti-HBc positive.

A diagnosis of hepatic failure due to hepatitis B virus (HBV) infection was made and the infant was transferred to another hospital on December 16 for possible liver transplantation. After transfer, the infant developed seizures and her condition deteriorated rapidly. She died on December 17.

The hospital where the infant was born had suspended administration of hepatitis B (HB) vaccine to all newborns during the summer of 1999 due to the concern about the presence of thimerosal used as a preservative in HB vaccine. This policy, in addition to several recording and reporting errors of the mother's positive HBsAg test led to this infant missing its birth dose of HB vaccine and hepatitis B immunoglobulin (HBIG). The infant received its first dose of vaccine at 2 months of age; however, for the vaccine to prevent transmission of the HBV, it must be received at birth.

### Survey of Missouri Obstetrical Hospitals

Now that thimerosal-free vaccine is available, the Missouri Department of Health, Section of Vaccine-Preventable and Tuberculosis Disease Elimination conducted a survey of birthing hospitals in Missouri to assess the status of hepatitis B tracking policies and reinstituting the birth dose of HB vaccine. A survey tool was developed and mailed to Missouri's 93 birthing hospitals. Six hospitals had closed their obstetrical units. Forty-one out of the 87 (47%) remaining hospitals responded to the survey. The results of those 41 survey responses are summarized below.

Thirty-eight (93%) of the hospitals have a policy for ensuring the HBsAg status

is known for all pregnant women prior to or at the time of delivery. Three (7%) of the hospitals had no policy for ensuring the pregnant woman's HBsAg status. Thirty-one (76%) of the hospitals have a policy for ordering the HBsAg test for expectant mothers upon admission if her status is unknown. Ten (24%) of the hospitals have no policy for ordering the HBsAg test.

Record-keeping procedures were also questioned in the survey. Thirty-six (88%) of the birthing hospitals ensure the mother's HBsAg status is recorded in the infant's chart. Five (12%) do not ensure the mother's HBsAg status is in the infant's chart.

Thirty-two (78%) have a policy to offer HB vaccine to all infants prior to discharge, regardless of the HBsAg  
(continued on page 2)

### Inside this Issue...

Page	
3	Frequently Asked Questions Regarding Perinatal Hepatitis B
11	<i>Mycobacterium tuberculosis</i> : Documenting Acquired Drug Resistance in Missouri
13	Early Syphilis in Men Who Have Sex With Men, Missouri, 1994–1999

(continued from page 1)

status of the mother. Nine (22%) have no policy to vaccinate newborns. Thirty-three (80%) of the hospitals have a treatment policy for infants born to mothers whose HBsAg status is not known at the time of delivery. Eight (20%) of the hospitals have no treatment policy for those infants.

## Discussion

On average, 19,000 pregnant women in the United States are chronically infected with HBV, and Missouri is estimated to have 127 HBsAg-positive pregnant women each year. A pregnant woman who is an HBV carrier can pass the infection on to her newborn baby at birth. Eighty-five to 90 percent of babies infected at birth will become carriers or chronically infected reducing their life expectancy. Twenty-five to 50 percent of children under the age of 5 infected with HBV are unable to clear the virus from their bodies within six months, and are considered to be chronically infected. The HB vaccine provides immunity in over 95 percent of recipients.

To prevent perinatal HBV transmission, infants born to mothers who are infected with HBV need to receive:

- 1) The appropriate first dose of HB vaccine within 12 hours of birth, along with HBIG;
- 2) The remaining appropriate doses of HB vaccine at 1–2 months and 6 months of age; and
- 3) Post vaccination serologic testing by 12–15 months of age to ensure they are not infected and have developed immunity to HBV.

In order to achieve these objectives for perinatal HBV infections, the following should be implemented:

- Assure all pregnant women are screened for HBsAg, which indicates the mother is infected with HBV, during her first trimester in **EACH** pregnancy. Laboratories and health care providers are required to report HBsAg-positive pregnant women to their local public

health agency or the Missouri Department of Health.

- Assure all infants of HBsAg-positive mothers receive HBIG at birth and three doses of HB vaccine by 6 months of age.

In national surveys conducted from 1993–1995, 85–93 percent of identified infants of HBsAg-positive mothers received HBIG and HB vaccine at birth; however, only 62–69 percent completed the HB vaccination series by 6–8 months of age. Supervised case management has been found to be a key element to assure high levels of completion of post-exposure prophylaxis.

The publication of the joint statement on thimerosal by the American Academy of Pediatrics and the U.S. Public Health Service (July 1999) resulted in a major reduction in the administration of the HB vaccine birth dose in hospitals. Now that thimerosal-free vaccine is available, resumption of HB vaccination at birth is important because confusion about recommendations, tracking, and reporting errors has resulted in some hospitals failing to immunize infants delivered to HBsAg-positive women. According to our survey, only 78 percent of Missouri's hospitals are even offering HB vaccine to newborns. The Centers for Disease Control and Prevention has reported that infants receiving HB vaccine at birth are more likely to complete the HB series than infants who do not receive a birth dose.

Missouri has a high rate of hospitals with policies for screening pregnant women and recording this information in the infant's chart; but Missouri still under-reports HBsAg prenatal cases by an estimated 27 percent. Since approximately 12–25 percent of Missouri's hospitals have no policies for screening pregnant women, recording the mother's HBsAg status, or vaccination of newborns, hepatitis B cases will be missed.

As illustrated in the case study, reinstituting the birth dose of HB vaccine

can provide a lifesaving safety net. Activities to reinstitute the birth dose of HB vaccine are continuing. Information was mailed in August to all Missouri birthing hospitals and physicians stressing the importance of administering HB vaccine at birth using the preservative-free HB vaccine. The mother's hepatitis B screening results and HBIG should be added to all newborns' vital records to ensure reporting.

We are providing on pages 3–4 answers to the most frequently asked questions regarding reporting and preventing perinatal hepatitis B.

If you have additional questions regarding the hospital survey or use of HB vaccine, please contact Ruby McPherson in the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313.

## REFERENCE:

1. Fasano N. Unprotected people... Infant dies of fulminant hepatitis B, 1999. Needle Tips and the Hepatitis B Coalition News 2000;10(1):12.

# Disease Reporting

Cases of reportable diseases and conditions should be reported promptly to your local health department, or to the Missouri Department of Health at

**(800) 392-0272**

(during working hours).

The emergency number is

**(573) 751-4674**

(for after hours, weekends or holidays).

# **Frequently Asked Questions Regarding Perinatal Hepatitis B**

The following are questions frequently asked by healthcare providers and laboratory personnel regarding reporting and preventing perinatal hepatitis B.

## **Who reports hepatitis B surface antigen (HBsAg) positive pregnant women?**

Reports of HBsAg-positive pregnant women come from a variety of sources: laboratories, prenatal care providers, delivery hospitals and local public health agencies.

## **How do I know which babies need hepatitis B immune globulin (HBIG) and hepatitis B vaccine?**

Serologic testing of all pregnant women for HBsAg is essential for identifying infants who require HBIG and hepatitis B vaccine. All pregnant women in Missouri are recommended by law to be serologically screened for hepatitis B virus (HBV), at their first prenatal visit.

## **How do you get household and sexual contacts tested?**

Hepatitis B testing and vaccine are available from the Missouri Department of Health for household, needle-sharing, and sexual contacts of HBsAg-positive, pregnant women. If any marker of the HBV serology is positive, the contact is not a candidate for hepatitis B vaccine. If, however, the contact's HBV serology is negative for hepatitis B markers; they should receive hepatitis B vaccine.

## **If a contact of an HBsAg-positive mother has had hepatitis B vaccine, should they be tested?**

Yes. Any contact of an HBsAg-positive mother should be tested. For children in the household who received the hepatitis B vaccine series as part of routine childhood immunizations, testing for HBsAg and anti-HBs is appropriate. Infants born to HBsAg-positive mothers previously enrolled in perinatal services, and who were previously tested after receiving the hepatitis B vaccine series, need not be retested.

## **Why is it important to do post-vaccination testing on infants born to HBsAg-positive mothers?**

Serologic testing will determine whether the infant responded appropriately to the vaccine. If the baby did not acquire immunity to hepatitis B, he/she must be revaccinated.

## **How do you get HBIG and hepatitis B vaccine for the infant and contacts? How is it paid for?**

Orders for HBIG and hepatitis B vaccine can be placed by your local public health agency. Hepatitis B vaccine and HBIG are provided free of charge by the Missouri Department of Health.

**What happens if the mother and infant are discharged from the hospital before test results are available and before the infant receives appropriate prophylaxis?**

The infant should receive the first dose of hepatitis B vaccine within 12 hours of birth, regardless of mother's HBsAg status. If the mother is later determined to be HBsAg-positive, the infant should receive HBIG, but no later than seven days after birth. The vaccine series should then be completed as scheduled.

**When should the perinatal hepatitis B report forms be sent to the Missouri Department of Health, Section of Vaccine-Preventable and Tuberculosis Disease Elimination?**

- Mother's summary report      within 15 days of initial report
- Infant summary report      within 15 days of birth,  
after each hepatitis B vaccine dose **and**  
when post-vaccine serology test results are available
- Contact summary report      within 15 days of initial report  
when their anti-HBc test results are available **and**  
after each hepatitis B vaccine dose

**Diagnostic Tests for HBV Antigens and Antibodies**

Marker	Abbreviation	Definition
Hepatitis B surface antigen	HBsAg	Shows acute or chronic infection; if detected longer than six months defines a carrier.
M class immunoglobulin antibody to hepatitis B core antigen	Anti-HBc IgM	Shows acute/recent infection with HBV detectable for four to six months.
Antibody to hepatitis B core antigen	Anti-HBc	Shows current acute infection or on-going chronic infection or previous resolved infection.
Antibody to hepatitis B surface antigen	Anti-HBs*	Shows past infection with HBV or vaccination for HBV. Indicates immunity to HBV.

\*Anti-HBs levels wane over time and may fall to a non-detectable level.  
Subsequent exposures to HBV may also cause rises in the level of HBs antibody.

If you have additional questions regarding perinatal hepatitis B, please contact:

**Missouri Department of Health**  
**Section of Vaccine-Preventable and Tuberculosis Disease Elimination**  
**Ph: (573) 751-6133**  
**or (800) 699-2313**

# What is MATEC-Missouri (Mid-West AIDS Training and Education Centers for Missouri)?

*Kay Williams, B.S.N., M.P.H., C.I.C.  
Project Coordinator  
MATEC-Missouri*

## Overview

The AIDS Education and Training Centers (AETC) is a national network of programs that collaborate with local community-based health care clinics and centers to ensure that HIV/AIDS care providers have access to a wide range of treatment information. The regional AETC are supported by the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act. Missouri is one of six mid-western states receiving HIV/AIDS Bureau of the Health Resources and Services Administration (HRSA) funding. MATEC-Missouri is hosted by Washington University School of Medicine in St. Louis, Missouri.

MATEC-Missouri offers specialized clinical education and consultation covering essential up-to-date information on the transmission, treatment, and prevention of HIV/AIDS. The education is provided in a variety of formats including workshops, hands-on supervised clinical training and conferences providing continuing education. The education programs are designed for the

needs of physicians, dentists, nurse practitioners, pharmacists, physician assistants and nurses caring for persons with HIV/AIDS. Medical faculty also provide timely clinical consultation in person, via the telephone or via the Internet. Knowledge of the disease and its treatment has increased exponentially, as has the need for dissemination of new information.

Training for clinicians and clinics is designed following an assessment of local needs. This effort is directed to clinics and centers serving under-served and hard-to-reach populations. One goal of HRSA and MATEC is to assure that the quality of emerging HIV/AIDS treatments makes a difference in the lives of people living with this disease. Therefore, special emphasis is placed on training Ryan White funded providers and those who are located in community-based organizations including rural health care facilities, community and migrant health centers, public health clinics, correctional facilities and other nonprofit organizations. Another goal is to provide quality educational programs around HIV/AIDS. The MATEC Individualized Clinician Training Program is designed to meet a unique set of characteristics and needs related

to the dynamic nature of the AIDS epidemic in under-served communities—ranging from highly impacted urban areas to outlying rural areas with inadequate access to providers.

## How to Take Advantage of These Training Opportunities

Individual clinicians and clinics nominate themselves for the program, or can be nominated by the community they serve. Once identified, nominees will be contacted by MATEC for an interview prior to acceptance into the program.

## Benefits and Responsibilities

Upon acceptance into the program, each participant or clinic will meet with a member of MATEC's experienced training staff to develop an individualized training plan for the year, based upon each person's or clinic's experience and interests. Participants will receive scholarships to allow attendance at all of the MATEC programs offered in the six-state region (Missouri, Illinois, Indiana, Wisconsin, Minnesota, and Iowa) during the training program period. Typical training programs offered may include the physician and multidisciplinary clinical preceptor program, clinical management seminars, skill-building workshops and special conferences that are held during the year. During the individualized training, each participant will be placed with experienced clinicians for on-site preceptorships at one of MATEC's many clinical affiliate sites and will be connected to expert providers for consultation during and after their training program year.

Participants will also have access to the MATEC-Missouri resource center and can loan out materials during their fellowship period. Participants may elect to be involved in the training planning process by serving on the MATEC Training Advisory Council, which meets in Chicago twice a year.

**For more information about MATEC-Missouri training opportunities, please contact:**

**Kay Williams  
MATEC-Missouri  
Washington University School of Medicine  
Campus Box 8134  
660 S. Euclid  
St. Louis, MO 63110  
Ph: (314) 362-2418 or (800) 432-0448  
Email: [williamk@psychiatry.wustl.edu](mailto:williamk@psychiatry.wustl.edu)**

You can also find additional information about MATEC by visiting their web site at <http://www.uic.edu/depts/matec/>.



# St. Louis STD/HIV Prevention Training Center Course Schedule

<http://www.stdhivpreventiontraining.org>

The St. Louis STD/HIV Prevention Training Center is located on the campus of Washington University School of Medicine, one of the top medical schools in the nation. As part of this prestigious institution, and in conjunction with the local health departments, the PT Center strives to provide students with cutting-edge information and research in the field of STD.

The St. Louis STD/HIV Prevention Training Center offers continuing education courses for health care providers throughout Region VII of the U.S. Public Health Service (Iowa, Kansas, Missouri, Nebraska). The Center is funded by a grant from the federal Centers for Disease Control and Prevention to the St. Louis County Department of Health. Partners in training include Washington University, St. Louis University, University of Missouri-St. Louis, the City of St. Louis Department of Health and Hospitals, Creighton University School of Medicine, and the Douglas County Health Department.

## Training Sites:

**Missouri:** Columbia, Kansas City, Portageville, Rolla, St. Louis

**Nebraska:** Kearney, Lincoln, Norfolk, Omaha, Scottsbluff

## Target Audience:

Health care professionals in public or private settings who provide clinical services to persons with STDs. Physicians, nurse practitioners, and physician assistants will find courses tailored to their level of expertise.

## CME Accreditation:

The St. Louis STD/HIV Prevention Training Center is accredited by the Missouri State Medical Association to sponsor continuing medical education for physicians.

## CEU Accreditation:

Barnes College of Nursing at the University of Missouri-St. Louis is approved as a provider of continuing education in nursing by the Missouri Nurses Association, which is accredited to approve continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation.

For further information or to register for courses, contact:

Delores (Dodie) Rother, MPH  
St. Louis STD/HIV Prevention Training Center  
Washington University School of Medicine  
660 South Euclid Avenue  
Campus Box 8051  
St. Louis, MO 63110  
Ph: (314) 747-0294 or 747-1522  
Email: [std/hiv@im.wustl.edu](mailto:std/hiv@im.wustl.edu)  
Web site: <http://www.stdhivpreventiontraining.org>

## Viral STD Update

This course is a comprehensive study of the diagnosis, management and treatment of the most common viral STDs (other than HIV). Topics include herpes simplex virus (HSV), human papillomavirus (HPV) and hepatitis, A, B and C. This course includes six hours of didactic sessions and eight hours of supervised clinical practicum.

**Course Dates:** March 8 & 15, 2001

**Course Time:** 8:00 am–11:30 am

**Course Fee:** \$40.00

14 hours category 1 CME

16.8 Contact hours

## STD Clinician

This course, an intensive overview of STDs, includes 18 hours of lecture, two hours of case discussion and 24 hours of supervised clinical practicum.

**Course Dates:** March 22, 29, April 5, 12, 19 & 26, 2001

**Course Time:** 8:00 am–12:00 pm

**Course Fee:** \$90.00

44 hours category 1 CME

52.8 Contact hours

## STD Update

This course provides up-to-date information on sexually transmitted diseases including recommendations from the Centers for Disease Control and Prevention 1998 STD Treatment Guidelines. This course includes nine hours of lecture and 16 hours of supervised clinical practicum.

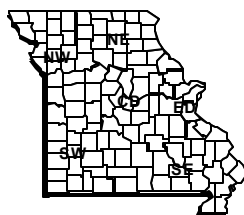
**Course Dates:** May 3, 10 & 17, 2001

**Course Time:** 8:00 am–11:30 am

**Course Fee:** \$65.00

25 hours category 1 CME

30.0 Contact hours



Missouri Department of Health  
Division of Environmental Health and Communicable Disease Prevention  
**QUARTERLY DISEASE OCCURRENCE**  
**BY REGION AND TIME PERIOD**

Reporting Period\*  
**July - September 2000**

Districts											3 Month State Totals		Cumulative January-September		
CD	** ED	NE	** NW	SE	** SW	*** OTHER	Kansas City	St. Louis City	St. Louis Co.	Spfd. Greene Co.	2000	1999	For 2000	For 1999	5 YR MEDIAN

Vaccine Preventable																
Influenza	1	0	0	0	2	0	0	0	0	0	0	3	3	2417	938	302
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	3
Pertussis	5	1	1	2	0	3	2	6	11	4	1	36	39	67	54	42
Viral Hepatitis																
A	1	2	0	0	1	20	1	7	2	4	1	39	143	287	360	863
B	2	2	1	2	0	8	2	4	6	5	4	36	30	360	111	220
C	1	0	2	0	2	0	0	0	1	0	0	6	5	16	7	na
Non-A Non-B	1	0	0	0	0	0	0	0	0	0	0	1	0	2	0	18
Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Meningitis																
Meningococcal Disease	0	3	0	1	0	0	1	1	1	0	0	7	9	24	35	36
Meningococcal Other	1	0	0	1	0	0	0	0	2	2	1	7	7	41	33	27
Enteric Infections																
Campylobacter	41	15	12	26	21	38	6	14	9	28	16	226	188	478	443	444
E. Coli O157:H7	4	10	2	8	5	7	0	3	0	13	1	53	22	89	35	37
Salmonella	33	17	5	24	32	22	5	19	14	43	8	222	250	535	560	441
Shigella	4	3	0	35	8	1	6	75	34	27	4	197	197	545	593	312
Parasitic Infections																
Cryptosporidiosis	3	1	0	0	2	1	0	2	3	2	1	15	13	23	20	22
Giardiasis	34	21	3	22	25	14	7	10	40	54	10	240	206	557	502	10
Respiratory Diseases																
Legionellosis	0	2	0	1	1	0	1	0	3	4	0	12	5	23	16	13
Sexually Transmitted																
AIDS	6	3	2	5	3	3	4	12	15	3	2	58	116	282	311	145
HIV Infection	6	4	6	4	5	6	0	15	14	14	5	79	106	215	323	n/a
Chlamydia	265	113	92	144	171	148		810	420	619	101	2883	3085	9521	10044	3085
Gonorrhea	107	32	29	24	77	43		737	495	485	40	2069	2059	6090	5609	2117
P & S syphilis	1	0	0	0	0	0		0	2	1	0	4	16	26	66	40
Tuberculosis																
TB Disease	2	1	1	3	10	4	3	10	9	5	4	52	48	147	131	n/a
TB Infections	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zoonotic																
Ehrlichiosis	9	5	4	0	0	4	0	0	1	4	1	28	19	42	21	10
Lyme Disease	1	0	0	2	12	1	0	0	0	1	1	18	29	39	58	38
Rabies (Animal)	5	5	0	4	1	1	0	0	3	9	0	28	11	43	25	23
Rocky Mountain Spotted Fever	5	1	1	1	3	4	0	0	0	0	0	15	8	34	14	14
Tularemia	6	0	1	2	0	2	0	0	0	0	4	15	9	26	15	11
No. of Outbreaks by Disease Agent	STATEWIDE TOTALS FOR JULY-SEPTEMBER 2000															
	Vaccine Preventable Diseases															
	Other Reportable Diseases															
	Hib Meningitis - 7															
	Brucellosis - 2															
	HUS - 1															
	Kawasaki Disease - 4															
	Listeria - 1															
	Malaria - 2															
Disease Group	#															
AGI	2															
ARI	1															
Giardiasis	1															
Norwalk-like	2															
Other	1															
Scabies	4															
Shigella	2															

\*Reporting Period Beginning July 2, 2000 and Ending September 30, 2000.

\*\*Totals do not include Kansas City, St. Louis City, St. Louis County, or Springfield

\*\*\*State and Federal Institutions and Unknown

n/a Data unavailable

Due to data editing, totals may change.

# Tuberculosis Awareness Fortnight and World TB Day

For 2001, Tuberculosis (TB) Awareness Fortnight will be held from March 19–30 and during this period of time World TB Day will be recognized as usual on March 24. Activities that are planned during TB Awareness Fortnight are listed as follows:

- March 19:** Vic Tomlinson, Chief, Section of Vaccine-Preventable and Tuberculosis Disease Elimination, will be speaking to a group of physicians in Kennett, Missouri.
- March 22:** Dr. Lee Reichman, a TB expert from the Model TB Center in New Jersey, will be speaking in St. Louis at Washington University and at Barnes-Jewish-Christian Hospital. The American Lung Association (ALA) of Eastern Missouri is sponsoring this event.
- March 27:** Dr. Mosbah Kreimid, with the Missouri Rehabilitation Center in Mount Vernon, Missouri and Diane Edwards, R.N., with the Section of Vaccine-Preventable and Tuberculosis Disease Elimination, will be speaking to physicians in the evening at the Holiday Inn in Joplin.
- March 29:** The Section of Vaccine-Preventable and Tuberculosis Disease Elimination, Missouri Department of Health, will host a reception for TB Awareness Fortnight in the Department of Health's 930 building in Jefferson City, Missouri.
- March 30:** Vic Tomlinson will be presenting at the Grand Rounds sponsored by ALA of Western Missouri at St. Luke's Hospital and UMKC School of Medicine in Kansas City for physicians, residents and medical students.

A nursing seminar that the ALA of Eastern Missouri will sponsor is tentatively planned during the period of TB Awareness Fortnight. Details will be available soon.

If you would like additional information regarding these TB activities, please call the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 611-2912, or the American Lung Association of Eastern Missouri at (314) 645-5505 or the American Lung Association of Western Missouri at (816) 842-5242.

## IMMUNIZATION VIDEOCONFERENCE

The Section of Vaccine-Preventable and Tuberculosis Disease Elimination will sponsor the following Centers for Disease Control and Prevention (CDC) live satellite broadcasts:

### **Epidemiology and Prevention of Vaccine-Preventable Diseases March 15, 22, 29 and April 5, 2001 (4-day course)**

This live interactive program will provide the most current information available in the constantly changing field of immunization. Session one will cover principles of vaccination, general recommendations on immunization and strategies to improve immunization coverage levels. Session two will cover diphtheria, tetanus, pertussis, rotavirus and polio. Session three will cover measles, mumps, rubella and varicella. Session four will focus on hepatitis B, *Haemophilus influenzae* type b, influenza and pneumococcal disease.

This live, interactive satellite videoconference will feature question and answer sessions in which participants can address questions to the course instructors on toll-free telephone lines. Continuing education credits for a variety of professions will be offered based on 14 hours of instruction.

For more information about the course, site locations and times, contact the immunization representative located in your district health office or the Section of Vaccine-Preventable and Tuberculosis Disease Elimination at (800) 699-2313.

# Missouri International Health Clinics - 2001

The following is a list of international health clinics in Missouri as of December 2000:

## Boone County

Elizabeth Allemann, MD  
Travelers Health Center  
1200 Fay Street  
Columbia, MO 65201  
Ph: (573) 443-3399

Thomas R. Cheek, MD  
Travel Connection  
Health Information CTR  
2300 Bernadette Dr  
Columbia, MO 65203  
Ph: (573) 882-4590

University of Missouri  
Student Health Center  
South 6th  
Columbia, MO 65211  
Ph: (573) 882-4661  
Attn: Jackie  
University of Missouri-Columbia  
students only by appointment

## Buchanan County

Shawn Griffin, MD  
Heartland Travel Clinic  
802 N Riverside Rd, Ste 100  
St. Joseph, MO 64507-9794  
Ph: (816) 271-1334

## Butler County

Kirby Turner, MD  
Kneibert Clinic  
686 Lester, P.O. Box 220  
Poplar Bluff, MO 63902-0220  
Ph: (573) 686-2411

## Clay County

Clay County Health Department  
1940 Highway 152  
Liberty, MO 64068  
Ph: (816) 781-1601  
Wed by appointment

## Cole County

Lorenzo D. McKnelly, DO  
Mid-Missouri Medical Consultants  
1111 Madison St  
Jefferson City, MO 65101-2785  
Ph: (573) 635-7651

Mark D. Winton, MD  
Donald P. Miller, MD  
Internal Medicine, Inc.  
Jefferson City Medical Group  
1241 W Stadium Blvd, Div 2200  
Jefferson City, MO 65109  
Ph: (573) 635-5264

## Greene County

Stephen D. Christiansen, MD  
Ozark Medical-Surgical  
Associates, Ltd.  
1900 South National, Suite 2800  
Springfield, MO 65804  
Ph: (417) 881-8819

Don S. Overend, MD  
Lisa Ovens, MD  
Jim Waterfield, MD  
Richard T. Honderick, DO  
Smith-Glynn-Callaway Clinic  
3231 South National  
Springfield, MO 65807-7396  
Ph: (417) 883-7422  
Mon-Fri 8-5pm/Sat 8-12noon

Springfield-Greene County  
Health Center  
227 East Chestnut  
Springfield, MO 65802  
Ph: (417) 864-1686  
By appointment only

## Harrison County

Hansa N. Patel, MD  
Natu B. Patel, MD  
Bethany Medical Clinic  
Box 506, South 69 Highway  
Bethany, MO 64424  
Ph: (816) 425-3154

## Jackson County

Joseph H. Brewer, MD, FACP  
Robert E. Neihart, M.D.  
Paul M. Jost, M.D.  
Plaza Internal Medicine  
Infectious Disease, PC  
4620 JC Nichols Parkway, Ste 415  
Kansas City, MO 64112  
Ph: (816) 531-1550

Allen J. Parmet, MD, MPH  
Midwest Occupational Medicine  
Union Hill Commons  
3037 Main, Ste 201  
Kansas City, MO 64108  
Ph: (816) 561-3480

Joseph F. Waeckerle, MD  
Albers Medical Inc.  
440 Broadway, Ste 116  
Kansas City MO 64111  
Ph: (816) 931-0100

## Jasper County

Dennis Estep, DO, MPH, MS, FACOEM  
Gary Brandon, DO, MPH, FACMP  
Freeman Occumed  
3201 McClelland Blvd  
Joplin MO 64804  
Ph: (417) 626-3047

Joplin City Health Department  
513 Kentucky Avenue  
Joplin, MO 64801  
Ph: (417) 623-6122  
Thurs, 10 am by appointment

## Jefferson County

John H. Krickbaum, MD  
Hillsboro Medical Services  
10661 Highway 21  
Hillsboro, MO 63050  
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# ***Mycobacterium tuberculosis*: Documenting Acquired Drug Resistance in Missouri**

Thomas H. Lindner

Missouri State Tuberculosis Laboratory

## **Introduction**

Individuals who are diagnosed with pulmonary tuberculosis (TB) and who are receiving proper therapy are expected to convert to sputum smear and culture negativity in a predictable amount of time, the sooner the better. What constitutes a predictable time is a cause for confusion, judging by inquiries made to the Missouri State Tuberculosis Laboratory (MSTBL) in Mt. Vernon. Some health care providers feel their patients should convert to negative in two weeks, while others suggest a two-month standard. Most providers are surprised to learn that a significant number of TB patients don't become culture negative until well into their fourth month of chemotherapy. Very few, if any, convert in two weeks.

Since sputum conversion is used as a yardstick to measure response to therapy, MSTBL frequently receives requests to repeat anti-tubercular drug testing. The scenario goes like this: the caller states that the patient has been on therapy for six weeks, is still smear and culture positive, so he must be resistant to one or more drugs. Could we please repeat the susceptibility? It is implied that the patient has developed acquired drug resistance, since he hasn't responded as quickly as anticipated.

Acquired drug resistance is defined as drug resistance that is known to be a result of chemotherapy. That is, an organism (*Mycobacterium tuberculosis*), known to be pan sensitive, develops resistance to one or more drugs during the course of chemotherapy. It is widely agreed that this occurs either because the patient was treated with an inadequate regimen or because the patient did not take the prescribed regimen appropriately. This acquired drug resistance

is determined (or found out) only by performing susceptibility tests on specimens still culture positive after some period of treatment.

In North America, regardless of the method of testing, a strain of *M. tuberculosis* should be considered resistant if one percent or more of the bacterial population is resistant to a designated concentration of a drug. This designated concentration is referred to by the Centers for Disease Control and Prevention (CDC) as the "critical concentration" for use in *in vitro* laboratory testing.

There exists no single hard and fast rule by which one determines when to repeat the drug tests while a patient is on treatment. However, it is important to test isolates obtained during the course of therapy under the following circumstances:

1. When the patient does not respond clinically within a few months.
2. When sputum does not convert to smear negative within two or three months of treatment or bacterial counts on solid media show no improvement.
3. When cultures do not become negative within four to six months.
4. When sputum shows a consistent increase in smear count after an initial decrease.
5. In cases of clinical relapse.

MSTBL has always attempted to review the culture history for those patients on whom we receive repeated specimens throughout their treatment course. By reflex testing, we repeat the drug susceptibility when one of the above criteria is met, but at no time sooner than two months into therapy. By two months, we denote the differential of the dates of acquisition of the respective positive specimens.

## **Results**

What is the rate of acquired drug resistance in Missouri, and how important is this rate? MSTBL maintains all its records in electronic form. These records are stored in Visual dBase 7.5 in relational database structure, and are inclusive from 1988 to present.

From 1988 to August 2000, drug susceptibilities were performed on 2,777 individual patients with *M. tuberculosis*. Repeated susceptibilities (two or more) were completed on 221 patients. Using the definition of acquired drug resistance previously stated, 15 cases were found that met the definition. A change in susceptibility pattern, usually from pan sensitive to single drug resistance, was observed for these patients. It should be noted that two patients had initial drug resistance and lost additional drugs during treatment. Laboratory records do not include the regimen of therapy that patients were receiving, but this means that these patients developed (acquired) drug resistance during chemotherapy after initially being susceptible to a drug. "During chemotherapy" is used rather loosely, since the patients' levels of compliance (adherence) to the drug regimen is unknown.

Based on these data, the acquired drug resistance rate for Missouri for this period is 0.5 percent ( $15/2777=0.005$ ). Isoniazid was the most likely drug to shift patterns, with 12 (0.4%) isolates becoming resistant during treatment after being shown sensitive initially. Rifampin followed with eight (0.3%) isolates. As a note of concern, seven (0.3%) patients developed acquired multi-drug resistance. This number accounts for almost half the cases in this 13-year dataset. These patients reflect a real failure in the system to successfully treat TB upon initial presentation.

(continued on page 12)

**Table 1. Rate of Acquired Drug Resistance to Tuberculosis Medications Used on Tuberculosis Patients, Missouri, 1988–2000.**

<b>Drug</b>	<b>No. of Patients*</b>	<b>Rate of Acquired Resistance</b>
Streptomycin	3	0.1%
Isoniazid	12	0.4%
Rifampin	8	0.3%
Ethambutol	1	<0.1%
Pyrazinamide	1	<0.1%
Multi-Drug Resistant	7	0.3%
<b>Total Patients</b>	<b>15</b>	<b>0.5%</b>

\*Since some patients became resistant to more than one drug, the totals for the five primary drugs do not equal the 15 patients.

**Table 2. Patterns and Years of Development of Acquired Drug Resistance Among 15 Tuberculosis Patients, Missouri, 1988–2000.**

<b>Patient</b>	<b>Initial Pattern</b>	<b>Resistance Development</b>
1	1992 Pan sensitive	93 INH 95 SM INH RIF EMB
2	91 Pan	91 INH
3	89 Pan	89 INH
4	95 SM	96 SM INH RIF
5	91 Pan	91 INH RIF 92 SM INH RIF
6	94 Pan	95 SM INH RIF
7	92 Pan	93 INH
8	88 EMB	88 RIF EMB
9	98 Pan	00 INH
10	89 Pan	90 INH
11	90 Pan	91 INH
12	92 Pan	93 INH RIF
13	92 Pan	92 INH
14	89 Pan	90 INH RIF
15	97 Pan	98 PZA

(continued from page 11)

Table 1 shows data for the primary anti-tubercular drugs.

The 221 patients for whom a second susceptibility test was performed represent eight percent of all susceptibility testing. These patients met one or more of the aforementioned criteria, and specimens were retested because of laboratory reflex or discussion with the attending physician.

Widespread use of directly observed therapy (DOT) began in Missouri in 1995. In that year 58.4 percent of TB patients were treated by DOT; this figure improved to 74.1 percent in 1996. If we review the patients in this dataset who developed acquired drug resistance, we find that 12 (80%) of the cases developed resistance between 1988–1995. (See Table 2.) **Only three episodes of acquired drug resistance have occurred in Missouri since widespread DOT has**

**been practiced.** This demonstrates the advantage of DOT and the reason that it was adopted as the standard of care in Missouri.

## Conclusions

Ideally, no case of acquired resistance should occur. If TB patients are diagnosed promptly, started on the four-drug regimen, given DOT with proper follow-up for six months, and are compliant with their course of therapy, then acquired drug resistance should never develop. Each case represents a failed opportunity to eradicate a pan-sensitive organism and to successfully treat the patient.

The good news is that these data suggest that very few TB patients in Missouri are developing drug-resistant strains during therapy. In reviewing almost 13 years of data, only 15 cases of acquired drug resistance could be found. A rate of 0.5 percent represents one case per two hundred cases of tuberculosis. Since Missouri experiences approximately 200 new cases of TB each year, we can expect to encounter one new case of acquired drug resistance each year.

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# Early Syphilis in Men Who Have Sex With Men, Missouri, 1994–1999

Cynthia Illy  
Kurt Kleier  
Office of Surveillance

Robert Hamm, M.D., M.P.H.  
Office of Epidemiology

## Introduction

Syphilis continues to be a disease of particular concern because of the severe damage it can cause in infected fetuses and congenitally infected infants, and in persons with neurosyphilis and with late stage manifestations that may involve multiple organ systems. In addition, studies have indicated at least a twofold to fivefold increased risk for HIV infection among persons who have genital ulcers such as those caused by syphilis.<sup>1</sup> A major outbreak of syphilis took place in the St. Louis area in the early 1990s<sup>2</sup>, and a smaller outbreak occurred in the extreme southeastern part of the state (the Bootheel) in 1997–1998.<sup>3</sup> The Missouri Department of Health (MDOH) and the St. Louis City Health Department are currently collaborating with the Centers for Disease Control and Prevention (CDC) in a program (which is being carried out nationwide) to eliminate syphilis.<sup>4</sup>

During the period from the late 1970s through the early 1980s, men who have sex with men (MSM) accounted for up to 50 percent of new syphilis cases in many urban areas in the United States.<sup>5</sup> However, in the years that followed, syphilis incidence in MSM declined, apparently related to an overall decrease in the level of risky sexual behavior among many gay men that resulted from concern regarding human immunodeficiency virus (HIV) infection. More recently, there have been reports of increased numbers of cases of syphilis or gonorrhea among MSM in different locations in the United States, associated with increases in high-risk sexual behaviors.<sup>6,7,8</sup> To determine whether a similar increase in syphilis cases among

MSM might be occurring in Missouri, MDOH's Office of Surveillance (OoS), in collaboration with the Office of Epidemiology (OOE), undertook a study of all male early syphilis cases reported to MDOH from 1994–1999.

## Methods

In Missouri, each reported case of syphilis is interviewed by a specially trained public health outreach worker known as a counseling and intervention specialist (CIS) or a disease intervention specialist (DIS). The CIS or DIS records information from the interview on a standard CDC STD interview record form (CDC-73.126). This record contains demographic and clinical information on the patient, as well as information on his/her sexual partner(s). For this study, interview records were obtained for **early syphilis** (primary, secondary, and early latent syphilis) cases in **males** reported to MDOH from 1994–1999. The information retrieved from these records, supplemented by syphilis surveillance data that had been reported to OoS, was then entered into a Microsoft Access database and analyzed using Microsoft Excel.

Each case was placed into one of two categories:

- a) "no history of male sexual contact" (if there was no evidence of sexual contact with another male), or
- b) "MSM" (if there was evidence of sexual contact with another male, regardless of whether the individual also had a female sexual partner).

More specifically, for a male patient to be classified as MSM, one of the following two criteria must have been met:

- 1) the patient answered "yes" to the question "Since 1978, have you had sex with a male?," or
- 2) named a male sex partner during the interview with the CIS or DIS.

A subcategory was established under MSM for cases that were bisexual. To be classified as bisexual, the individual must have met the criteria for MSM and then either have answered "yes" to the question "Since 1978, have you had sex with a female?," or named a female sex partner during the interview.

## Results

From 1994–1999, there were a total of 4,053 early syphilis cases reported in Missouri; 2,026 (50.0%) of these cases were male. African-American men comprised 1,813 (89.5%) of the 2,026 male cases, white men accounted for 182 (9.0%) cases, and the remaining 31 (1.5%) male cases were of other/unknown race. The largest numbers of male early syphilis cases were in 20–29 year olds, 656 (32.4%), followed by 30–39 year olds with 629 (31.0%) cases, and 40–49 year olds with 349 (17.2%) cases. Men 50 years of age and older accounted for 215 (10.6%) cases, and 177 (8.7%) cases were in young men under the age of 20. A majority of the male cases, 1,160 (57.3%), were from St. Louis City. St. Louis County, Kansas City and the outstate area had 484 (23.9%), 125 (6.2%), and 257 (12.7%) cases, respectively.

Of the 2,026 male early syphilis cases reported from 1994–1999, interview records were located for 1,931 (95.3%). Of these 1,931 cases, 140 (7.3%) indicated they had engaged in sexual contact with another male, and were classified as MSM. African-Americans and whites were the only racial groups represented in the early syphilis MSM cases; 109 (77.9%) of the 140 MSM cases were in African-American men and 31 (22.1%) were in white men. The 30–39 year age group had the largest number of MSM cases, 60 (42.9%), followed by 20–29 year olds with 51 (36.4%) cases, and 40–49 year olds with 15 (10.7%) cases. Nine (6.4%) MSM cases were under the age of  
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20, and 5 (3.6%) cases were in men 50 years of age and older. St. Louis City had the largest number of MSM cases with 67 (47.9%), followed by St. Louis County with 31 (22.1%), Kansas City with 26 (18.6%), and the outstate area with 16 (11.4%). (See Table 1.)

Of the 140 MSM early syphilis cases, 51 (36.4%) indicated they had also had sexual contact with a female, and were consequently classified as bisexual. African-Americans comprised 45 (88.2%) of the 51 bisexual cases, and whites comprised the 6 (11.8%) remaining cases. Twenty-one (41.2%) of the bisexual cases were 30–39 year of age, 20 (39.2%) cases were 20–29 years old, 5 (9.8%) cases were 40–49 years old, 3 (5.9%) cases were 50 years of age or older, and 2 (3.9%) cases were under the age of 20. Of the 51 bisexual cases, 28 (54.9%) were from St. Louis City, 11 (21.6%) from St. Louis County, 6 (11.8%) from Kansas City, and 6 (11.8%) from the outstate area. (See Table 2.)

Total numbers of reported cases of early syphilis, as well as reported early syphilis cases in males (and females), consistently declined over the six-year period from 1994–1999, from 1,693 total cases (864 male cases) reported in 1994 to 195 total cases (91 male cases) reported in 1999. Among male early syphilis cases, generally consistent declines were seen during this period in both African American and white men. (See Table 3.)

Early syphilis cases in MSM (including cases in bisexuals) also showed a generally constant decline during this period from 50 total MSM cases (including 19 cases in bisexuals) in 1994 to 6 cases (including 2 cases in bisexuals) in 1999. Declines in reported MSM cases were seen in both African American and white men. (See Table 3.)

## Discussion

From 1994–1999, the annual number of early syphilis cases reported to MDOH consistently declined; declines were

**Table 1. Reported Early Syphilis Cases in Males by History of Male Sexual Contact, Race, Age Group, and Geographic Area, Missouri, 1994–1999.**

Race	MSM*		No History of Male Sexual Contact		Total Males	
African Americans	109	77.9%	1,624	90.7%	1,733	89.7%
Whites	31	22.1%	141	7.9%	172	8.9%
Other/Unknown	0	0.0%	26	1.5%	26	1.3%
<b>Age Group</b>						
<20	9	6.4%	159	8.9%	168	8.7%
20–29	51	36.4%	583	32.6%	633	32.8%
30–39	60	42.9%	538	30.0%	598	31.0%
40–49	15	10.7%	312	17.4%	327	16.9%
≥50	5	3.6%	199	11.1%	204	10.6%
<b>Area</b>						
St. Louis City	67	47.9%	1,033	57.7%	1,100	57.0%
St. Louis County	31	22.1%	418	23.3%	449	23.3%
Kansas City	26	18.6%	99	5.5%	125	6.5%
Outstate	16	11.4%	241	13.5%	257	13.3%
<b>Total</b>	<b>140</b>	<b>100.0%</b>	<b>1,791</b>	<b>100.0%</b>	<b>1,931</b>	<b>100.0%</b>
<b>Row Percent</b>		<b>7.3%</b>		<b>92.7%</b>		<b>100.0%</b>

\*Men who have sex with men

**Table 2. Reported Early Syphilis Cases in Men Who Have Sex With Men by Bisexual Status, Race, Age Group, and Geographic Area, Missouri, 1994–1999.**

Race	Not Bisexual		Bisexual		Total MSM*	
African Americans	64	71.9%	45	88.2%	109	77.9%
Whites	25	28.1%	6	11.8%	31	22.1%
Other/Unknown	0	0.0%	0	0.0%	0	0.0%
<b>Age Group</b>						
<20	7	7.9%	2	3.9%	9	6.4%
20–29	32	36.0%	20	39.2%	51	36.4%
30–39	39	43.8%	21	41.2%	60	42.9%
40–49	10	11.2%	5	9.8%	15	10.7%
≥50	3	3.4%	3	5.9%	5	3.6%
<b>Area</b>						
St. Louis City	39	43.8%	28	54.9%	67	47.9%
St. Louis County	20	22.5%	11	21.6%	31	22.1%
Kansas City	20	22.5%	6	11.8%	26	18.6%
Outstate	10	11.2%	6	11.8%	16	11.4%
<b>Total</b>	<b>89</b>	<b>100.0%</b>	<b>51</b>	<b>100.0%</b>	<b>140</b>	<b>100.0%</b>
<b>Row Percent</b>		<b>63.6%</b>		<b>36.4%</b>		<b>100.0%</b>

\*Men who have sex with men

seen in both male and female cases, and in both African Americans and whites. In addition, the numbers of reported

cases of early syphilis in MSM in Missouri did not show any noticeable increases during this period. Instead,

**Table 3. Reported Total, Male, and MSM\* Early Syphilis Cases by Year of Report, Missouri, 1994–1999.**

	1994	1995	1996	1997	1998	1999	Total
<b>All Cases</b>							
African Americans	1,525	999	425	276	216	148	3,589
Whites	159	89	38	37	39	30	392
Other/Unknown	10	3	17	7	19	17	73
<b>Total</b>	<b>1,693</b>	<b>1,091</b>	<b>480</b>	<b>320</b>	<b>274</b>	<b>195</b>	<b>4,053</b>
<b>Males</b>							
African Americans	779	493	218	137	114	72	1,813
Whites	82	39	17	14	19	11	182
Other/Unknown	3	2	6	4	8	8	31
<b>Total</b>	<b>864</b>	<b>534</b>	<b>241</b>	<b>155</b>	<b>141</b>	<b>91</b>	<b>2,026</b>
<b>MSM*</b>							
African Americans	42	31	15	8	8	5	109
Whites	8	9	5	3	5	1	31
Other/Unknown	0	0	0	0	0	0	0
<b>Total</b>	<b>50</b>	<b>40</b>	<b>20</b>	<b>11</b>	<b>13</b>	<b>6</b>	<b>140</b>

\*Men who have sex with men

consistent with the overall statewide trend in early syphilis cases, cases in MSM showed generally steady yearly declines.

Although these findings do not provide any evidence of an increase in syphilis incidence in MSM in Missouri, there are reasons why continued monitoring of this situation needs to occur. First, the actual numbers of male early syphilis cases who are MSM could be somewhat higher than is indicated by a review of STD interview records, since some patients may have been hesitant to reveal certain facts regarding their sexual behaviors and/or to name all of their sexual partners. Second, even though the numbers of reported early syphilis cases in Missouri MSM appear to have been declining, this does not necessarily mean that levels of risky sexual behaviors are also declining. It is possible that levels of such behaviors might even be increasing in certain MSM populations. However, because of the apparent low prevalence of syphilis infection in these populations at the present time, this risky behavior would not be resulting in any appreciable transmission of *Treponema pallidum* (although transmission of other sexually transmitted pathogens, including HIV, could

potentially be taking place). It should be noted that behavioral survey findings have indicated the continuing presence of behaviors associated with STD/HIV transmission—such as multiple sexual partners, inconsistent condom use, and non-injectable drug use—in certain at-risk MSM populations in Missouri.<sup>9</sup> However, whether these behaviors are becoming more prevalent is not known. OoS hopes, contingent on available future resources, to conduct further behavioral studies of Missouri MSM to help address this important question.

While there is no current evidence of an increase in syphilis infections among MSM in Missouri, the recent reports of outbreaks of syphilis and other bacterial STDs among MSM in other areas of the country<sup>6,7,8</sup>, along with studies documenting an increase in risky sexual behaviors in MSM in some locations<sup>7,8</sup>, indicate that maintaining low levels of STDs in this population will require ongoing effort. OoS will continue to monitor the occurrence of early syphilis cases in MSM in Missouri through examination of STD interview records from all male cases.

STD surveillance and clinic staff in St. Louis City and Kansas City provided

vital support in accessing interview records for patients from these locations.

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## LATE BREAKERS

- ☞ The U.S. Public Health Service recently released updated guidelines for use of antiretroviral drugs in HIV-positive pregnant women to reduce the risk of perinatal HIV transmission. These guidelines are available online at: <http://hivatis.org/trtgdlns.html#Perinatal>. In addition, you can have a PDF file sent directly to your email address, or you can request a single printed copy be mailed to you, by contacting the HIV/AIDS Treatment Information Service (ATIS) at 1-800-448-0440, or at <http://hivatis.org/request.html?list>.

In addition to the guidelines for HIV-infected pregnant women, other current HIV/AIDS treatment guidelines are available at the HIV/AIDS Treatment Information Service (ATIS) web site: <http://hivatis.org/trtgdlns.html>.

- ☞ "Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians" is available online at: <http://www.ama-assn.org/ama/pub/category/3629.html>. This primer is produced collaboratively by the American Medical Association, the Centers for Disease Control and Prevention, and other federal agencies. It is intended to provide health professionals with current and accurate information for the diagnosis, treatment, and reporting of foodborne illnesses. In addition, it provides health care professionals with patient education materials on prevention of foodborne illness, and it also offers 3.0 hours of Category I Continuing Medical Education or Continuing Education Units.

An additional web site containing useful information on foodborne illnesses and their prevention is "www.FoodSafety.gov: Gateway to Government Food Safety Information." The web site address is: <http://www.foodsafety.gov/>.

- ☞ Missouri's Family Care Safety Registry was established by law to protect children and the elderly in this state and to promote family and community safety by providing background information on potential caregivers. Beginning in January 2001, families and employers can call the registry's toll-free telephone line to request background information on registered child-care and elder-care workers or to request licensure status information on licensed child-care and elder-care providers. Information is provided at no cost. For further information, contact the Family Care Safety Registry toll free at (886) 422-6872, or visit their web site at <http://www.health.state.mo.us/FCSR>.